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Network Learning as an Educational Principle in Higher Education

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Abstract

The traditional way of educating nature management students, in which students are trained to solve relatively simple and technical problems, is no longer sufficient. Societies are changing towards a network society, which makes nature management more complex. This asks for new competences and new learning strategies in nature management education. Therefore, VHL University of Applied Sciences started two pilots in 2012. The goal of these pilots was to create a network of lecturers and students, nature conservationists and local stakeholders to create sustainable and innovative nature management strategies within a local context. Network learning was the leading learning strategy in both these pilots. In this paper we use these pilots for an evaluation of network learning as an educational principle for higher education. The pilot will be assessed on criteria based on three perspectives: 1) the changing society, 2) educational theories and 3) a theory on learning networks. The paper results in recommendations for further use of network learning as an educational principle in general.

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1. Introduction

Western society is changing towards a network society (Castells, 2000). In the field of nature management this is seen in a shift from a central or government controlled society to a society in which decisions are taken in a decentralized way (Stobbelaar, Koedoot, & Santegoets, 2013; Buijs, et al., 2012). These changes have led to more complex decision making in nature management. This new situation asks for new competences and new learning strategies in nature management education. Traditionally, students of Universities of Applied Sciences (UAS) were trained to solve relative simple and technical problems. This method was based on situations in which the client experienced a clear problem or a problem that could be clarified. However, multi-stakeholder decision making leads

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to problems that are much less clear. Because of this we require new educational principles to teach competences that fit these kinds

Insights in cause/effect relations (solutions)	Policy objectives and starting points (problems)		
		C lear	Unclear
	C lear	(1) Traditional engineering	(2) Negotiation
	Unclear	(3) Scenario's	(4) Network learning

Fig 1. Problems and solutions. Based on Thompson, 2003 (Thompson, 2003)

of situations. Figure 1 shows an overview of 4 different types of problem/solution combinations. New competences are needed for number four especially.

Therefore, VHL UAS started two pilots in 2012. The goal of these pilots was to experiment with network learning as a new educational principle. In both pilots networks were created that consisted of lecturers and students, nature conservationists and local stakeholders were created. Both pilots together were used as a case study for an evaluation of network learning as an educational principle for higher education.

The aim of this case study is to analyse network learning as an educational principle and to advise on the use of network learning in higher education.

2. Method

We have identified three perspectives from which we will look into these pilots: the societal demand, didactics and the theory on network learning. In order to analyse network learning as an educational principle we have created a set of criteria based on the three perspectives described above. These criteria were obtained by reviewing relevant literature. We used these criteria to analyse the pilots executed in 2012.

3. Criteria

3.1. Societal demand

The change towards a network society has led to a situation in which many different stakeholders are involved in decision making. Power and responsibility are diffuse, it is no longer possible for one actor to make a final decision (Stobbelaar, Koedoot, & Santegoets, 2013; Salverda, Pleijte, & Pappa, 2012; Van der Steen, Peeters, & van der Twist, 2010). If any nature conservation organisation or government wants to achieve something in this network society, they will have to make coalitions with other stakeholders (Stobbelaar, 2012). At the same time, related to this change, a situation occurs in which nature conservation organisations come across problems to which they are unable to formulate a clear question towards an engineer (fig 1).

From this we derive two main demands from society: (1) finding a way to solve complex problems where question and answer are unclear and (2) finding a way to act in a network society in which multi-stakeholder participation is very important. These are the criteria we will use to assess our two pilot projects.

3.2. Didactical perspective

From a didactical viewpoint we analysed the pilots on two of the most renowned educational theories: Miller's pyramid of competence and Kolb's learning cycle. Kolb distinguishes four different learning preferences: concrete experience, reflective observations, abstract conceptualization and active experimentation. These learning styles should be seen as a learning cycle. Kolb argues that effective learning is attained when a student has gone through all four stages (Kolb, 1984). Miller proposes a hierarchical pyramid of competence consisting of four stages. The student (1) knows, (2) knows how, (3) shows how and (4) does (Gulikers, Bastiaans, & Kirschner, 2005). The didactical aim of this pilot was to assess the students at the highest level of Miller's pyramid, where students are assessed in a real workplace environment.

The criteria that we derived from these theories were defined as: (1) The assessment was a reflection of the highest stage in Miller's Pyramid and (2) The students have gone through all four stages of Kolb's learning cycle.

3.3. Network learning perspective

There are many different terms and definitions that describe some form of learning in communities: social learning, interactive learning, communities of practice etc. For this research we looked for similarities rather than differences between all these different definitions. We decided to work with Reeds definition of social learning as his definition seems to cover most other (sub) definitions. Reeds states that when learning is to be considered social learning it must: "(1) demonstrate that a change in understanding has taken place in the individuals involved. (2) go beyond the individual to become situated within wider social units or communities of practice within society; and (3) occur through social interactions and processes between actors within a social network" (Reed, et al., 2010).

Network learning is a way of learning that naturally occurs (Reed, et al., 2010; Wenger, 1998). Wenger and Reed use examples of the workplace, but the theory (and the examples) can be applied to all kinds of situations. Since learning networks arise spontaneously in all kinds of situations, we argue that for a set-up network to be effective it should be close to a network that would naturally have developed.

This leads to two criteria: 1) the networks in the pilots fit into Reeds definition and 2) the networks are close to the network that would naturally arise in these situations.

4. Case description

During the first term of the academic year 2012/2013 VHL UAS started two pilots in which a group of part-time students (4th year) of forest and nature management participated. Both pilots were part of a long-term co-operation between VHL UAS and Natuurmonumenten (NM), a Dutch nature conservation organisation. The pilots are based on an objective wish from NM to reposition themselves in the new network society (Natuurmonumenten, 2011). All this is part of a larger project in which VHL helps NM in this repositioning process.

4.1. Pilot project 'De Liemers'

The pilot De Liemers focusses on the objective of NM to 'be an inspiration for nature minded people'. NM wants to get the discussion started into debate with people, wants to aim at making decisions together and would like to work towards this goal together with other stakeholders. The goal of this project was to investigate the involvement of residents and other local stakeholders can get involved in increasing the value of nature, landscape and the experience of both. (Stobbelaar, Koedoot, & Santegoets, 2013). The learning network consisted of students, lecturers, an ecologist and a communication specialist of NM.

4.2. Pilot project 'Bergherbosch'

Another objective of NM is to increase entrepreneurship; which is the focus of the second pilot. Previous research in the Bergherbosch area has shown that both NM and local entrepreneurs are interested in closing

coalitions from which all parties benefit. The aim of this pilot is to further shape this collaboration (Stobbelaar, Koedoot, & Santegoets, 2013). The learning network consisted of students, teachers and nature managers of NM.

5. Analyses

In this paragraph we will analyse both pilot projects using the criteria formulated before.

(1) *Finding a way to solve complex problems to which question and answer are unclear.* Project De Liemers focusses on how to be an inspiration, this is not a clear problem with a clear research question nor is there an easy answer to this question. In Bergherbosch the problem does not seem very complex, since both NM and the local entrepreneurs already agreed to establish some sort of collaboration. (2) *Finding a way to act in a network society in which where multi-stakeholder participation is very important.* In the De Liemers many actors are involved, since ‘being an inspiration’ is not something NM can achieve on its own. In Bergherbosch fewer stakeholders were involved, basically just NM and the entrepreneurs. However, the local residents and other users of the area can be seen as stakeholders too. (3) *The assessment was a reflection of the highest stage in Miller’s Pyramid.* The same type of assessment was used in both pilot projects. The assessment consisted of a report in which the students advise NM. The students were thereby responsible for the progress and the outcome of the project. The situation was real, so we can conclude that the assessment took place on the highest level of Miller’s Pyramid “does”. (4) *The students went through all four stages of Kolb’s learning cycle.* During the pilots no specific attention was given to Kolb’s learning cycle. Interviews show that the attention of the team was more on experimenting and experiencing than on reflection and conceptualisation. The natural learning style of the student was quite important in this case. Students who have a preference for reflection and conceptualisation experienced a more effective learning experience than those with other preferences. It happened that students in De Liemers had that learning preference and therefore had a more effective learning experience than student participating in Bergherbosch. (5) *The network meets Reed’s definition of social learning.* In De Liemers the conditions created made it possible for the learning to be social learning, therefore Reed’s definition applies. In Bergherbosch it can be argued whether Reed’s definition had been met, since the society outside the network was not involved in the decision making. (6) *The network established was close to a naturally developed network.* Including students in the network was not a natural in both situations. Teachers and students learning together is also something that does not happen in natural situations. The other stakeholders involved were all natural participants in this situation. Figure 2 gives an overview of the projects and their scoring on the criteria.

Criterion	De Liemers	Bergherbosch
finding a way to solve complex problems where question and answer are unclear		
finding a way to act in a network society in which multi-stakeholder participation is very important		
The assessment was a reflection of the highest stage in Miller’s Pyramid		
The students have gone through all four stages of Kolb’s learning cycle		
The network meets Reed’s definition of social learning		
The network established was close to a naturally developed network		
Total		

Figure 2 an overview of the analysis of network learning as educational principle.

6. Discussion

Interviews with the lecturers involved showed the most important didactical challenges that they and their students faced. The lecturers struggled with the cooperation between students and lecturers. Working together with co-workers turned out to be very different from working together with students, even though the students were all adults with working experience. The students were not always as responsible as needed; sometimes there was a lack of professionalism. Another struggle was experienced with the different roles that had to be played like project participant, student coach and assessor. Combining these roles was time (and energy) consuming. Also time consuming was staying in close contact with students, lecturers, researchers, stakeholders in de projects and NM. The students experienced difficulties with the vagueness and uncertainties in the pilots. The criteria on which the students would be assessed were unclear for some time during the process and the end product could not be specified in advance, this was a totally new situation for the students.

Both pilot projects have had a satisfying outcome that could not have been achieved by the standard way of teaching. The pilot De Liemers was the more successful of the two pilots. Our analysis shows that this was a more suitable situation for network learning, which may be one of the reasons for the success of this project. Therefore we can conclude that network learning is a good educational principle in complex situations when you pay attention to Kolb's learning cycle and form a network close to a network that would have developed naturally. However, it should be recognized that network learning will be complex and time consuming. Another important outcome was that we learned that lecturers and students can work together in a project. We also learned that this requires different competences from the lecturers, the lectures (and students) should be able to let go of the traditional hierarchical structure. Since both are part of the learning network, the lecturers no longer have the exact correct answers to all questions of the students. However, the criteria on which the students will be assessed should be clear from the start. Choosing a good assessment method is crucial for assessing at the highest level of Miller's pyramid. This was one of the challenges we faced. An assessment method in the direction of a portfolio in which large part consists of reflecting on the student's own learning goals might be more suitable than an advice report.

7. Recommendations

First, lecturers and students need to realise that this type of education involves a new hierarchical structure. Network learning asks for lectures to take a step back and let the students be in charge of their own learning at some points. In the process of the projects, communication with the students is very important, it is important to be clear about the indistinctness and to ensure that clear agreements on what is expected on the assessment are made. We recommend including a lecturer in the student coaching that is not involved in the network to guarantee the objectiveness of the assessment. We hope this paper will stimulate others to experiment with network learning as an educational principle. We think it is a promising new tool to connect professional education to the new arisen network society.

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