Chapter 4. TransLearning as a tool to facilitate vicarious learning

Chapter 2 and 3 provided insights into how the adaptive capacity framework, together with the process of defining and balancing core values, may reduce the functional task uncertainty of managers. Another way of reducing functional task uncertainty is through vicarious learning; learning from the experiences of other managers in the governance of niche experiments with comparable dynamics. For managers to vicariously learn from the experiences of managers of other niche experiments, the exchange of experiential knowledge is required. In this chapter, I will explore how the exchange of experiential knowledge can be supported by determining the vicarious learning potential of a specific tool, namely, TransLearning. TransLearning is a web-based system which was developed to organise the exchange of learning experiences in the context of sustainable development of the agricultural sector.

4.1 Introduction

Sharing knowledge and learning are essential in system innovation projects. Supporting this learning and sharing knowledge process was the main aim of the TransLearning project that is discussed in this chapter. The TransLearning project was set up in the context of sharing learning experiences and practice-based knowledge on the transition towards a more sustainable agriculture. Sustainable development refers to an increased search towards new Triple P value propositions that are characterized by a better balance between economic, social and ecological performance (de Wildt-Liesveld et al., 2013). However, sustainable development is complicated since the associated problems are hard if not impossible to resolve within the current systems of production, distribution and consumption. These problems are therefore often described as wicked problems (Rittel & Webber, 1973). Achieving sustainability requires radical changes of current practices (Elzen & Wieczorek, 2005; Siebenhüner & Arnold, 2007). This process is referred to as a system innovation, i.e. a gradual, continuous process of structural change in the way a societal system operates (Faber et al., 2004; van der Brugge et al., 2005).
System innovations are difficult to realize since they involve extremely complex, unstructured and dynamic processes. Since system innovations require changes in many aspects that influence each other and imply changes at various levels, i.e. micro-, meso-, and macro level (Elzen & Wieczorek, 2005), they cannot be accomplished by the interventions of a single organisation or discipline. Instead, system innovations require the cooperation of actors from different disciplines and with different institutional backgrounds (Regeer & Bunders, 2003; Elzen & Wieczorek, 2005), referred to as a transdisciplinary (Klein et al., 2001; Regeer & Bunders, 2003) or mode-2 (Regeer et al., 2009) approach. Experience shows that implementing such mode-2 strategies is not straightforward and therefore requires continuous learning (Regeer et al., 2009). In the context of sustainable development, this learning process of generating new knowledge comprises creating new capacities, strategies, skills, values, understandings and future images regarding sustainable development.

In system innovation project teams, learning requires the integration of the knowledge, perspectives and methodologies of the different stakeholders involved. Besides learning within projects (intra-project learning), it is also important that outsiders are enabled to learn from the experiences and knowledge gained during the execution of system innovation projects. This inter-project learning is important since in practice, system innovations do not result from one single project, but arise from a combination of sub-innovations or projects. This requires continual fine tuning and learning about the approaches applied within related projects.

For intra- and inter project learning to occur, sharing learning experiences and knowledge is essential. However, experiences and knowledge that are created within system innovation projects appear to be embedded within practice (Regeer et al., 2009) and context specific, and therefore hard to make explicit and to share with others (Hasan et al., 2006; Regeer, 2009). Hislop (2003) also states that the embodied nature of tacit knowledge and its embeddedness in social and cultural values make it more difficult to share successfully. This raises the question of how to communicate or disseminate learning experiences and practice-based knowledge created within system innovation projects in such a way that both intra- and inter project learning is facilitated. Within the context of the TransLearning project, learning was broadly defined as developing knowledge on how to effectively manage and support system innovation projects. According to this definition, learning has taken place when the process of system innovation was facilitated.
The dissemination of practice-based knowledge to enhance learning is increasingly supported by Knowledge Management Systems in which knowledge is created, gathered, organised and disseminated (e.g. Alavi & Leidner, 1999; King & Marks, 2008). The aim of the TransLearning project was therefore to develop and experiment with a Knowledge Management System, or web-based environment, to support learning - to archive, analyse and disseminate learning experiences and practice-based knowledge - within, between and from projects that are part of the TransForum network (a system innovation programme, funded by the Dutch government, aiming for a more sustainable agriculture). The project resulted in the release of the TransLearning system in December 2011, accessible via www.translearning.net. TransLearning is a web-based environment that archives the personal stories and learning experiences of the actors involved in three TransForum projects (Liesveld et al, 2010). These stories are reflected in film fragments in which the actors tell about their experiences regarding the innovation project they are involved in. In this way, learning experiences can be shared and both intra- and inter project learning may be facilitated.

This chapter addresses the question of how TransLearning may facilitate vicarious learning in the context of system innovation towards a more sustainable agriculture. To this end, first the theoretical foundation of the TransLearning system is presented, after which the technical aspects of TransLearning are discussed. In the results section the experiences and perspectives of interviewees and workshop participants on how their learning needs are supported by the TransLearning system are presented, resulting in an illustration of how TransLearning facilitated vicarious learning in the context of sustainable development.

### 4.2 Requirements for disseminating learning experiences

The TransLearning project focused on the search towards an approach to disseminate learning experiences and practice-based knowledge in such a way that intra- and inter-project learning is facilitated. Our quest started with a literature study on tacit knowledge, vicarious learning and learning histories from with we derived a theoretical framework to ground the development of TransLearning as a tool to disseminate learning experiences. This section shows the theoretical foundation of TransLearning in consecutive argumentation steps.

The TransLearning project focused on sharing practice-based knowledge within and across system innovation projects in the field of sustainable agriculture. Knowledge
and experiences created in system innovation projects are embedded in practice. This embedded nature of practice-based knowledge encompasses two aspects. First, it appears that many outcomes of the innovation processes are context and time-specific and generalising findings to other situations is complicated (Newell et al., 2006). Secondly, practice-based knowledge is said to be embodied, meaning that knowledge is generated within a specific person and therefore is an integral part of the person who generated the knowledge (Collins, 1993; Blackler, 1995). Embodied knowledge is acquired by doing and often action-oriented, and therefore only partly explicit (Blackler, 1995).

In practice it seems to be very difficult to communicate context-specific and embodied knowledge to others. For example, disseminating practice-based knowledge via reports, books and scientific chapters is not well received by some of the stakeholder groups and does not communicate learning experiences to third parties in such a way that learning is stimulated (Regeer, 2009). So, how is embedded practice-based knowledge to be disseminated to enable both intra- and inter project learning?

The central concept in answering this question is the experience, in which the contextual, situated knowledge is embedded. According to Kolb (1984), learning through experience is one of the basic mechanisms of learning. Experiential learning is a process through which knowledge is created through the transformation of experiences (Kolb, 1984). Besides learning from own experiences by a process of learning by doing, people may also learn indirectly through the experiences of others. This is referred to as observational learning (Warden et al., 1940 in Bandura & Huston, 1961; Maccoby & Wilson, 1957), learning through vicarious experience (Guba & Lincoln, 1989), or vicarious learning (Logan et al., 1955). The term vicarious learning is used to refer to learning through observing the experiences of others. The idea of vicarious learning is that one can learn from the problems others encounter and especially from the way they solve or deal with these problems (Cox et al., 1999). For learning through vicarious experience to occur, the learner needs to be able to re-experience the situation or problem the experience was based upon (Regeer et al., 2009). By re-experiencing or reviving a vicarious experience, one is stimulated to reflect on both the described and his or her own situation (Boud et al., 1985) thereby supporting learning. Thus, to stimulate learning within and across system innovation projects, the first requirement reads: TransLearning should disseminate learning experiences in such a way that it enables outsiders to re-experience the experiences of others. This perspective of vicarious learning guided the development and design of TransLearning
by searching for an answer to the question: How can the re-experience of experiences and thus vicarious learning be facilitated?

Re-experiencing an experience requires thick description (a term originated in anthropology, Geertz, 1973): a detailed description of the context of the experience (Guba & Lincoln, 1989). Thick description includes showing or describing an experience within its own context, its own time and place, thereby enabling other people to make sense of the situation and to step in the shoes of the person who is the original learner. The importance of sharing as much as possible of the original learning situation is also acknowledged by Procter et al., (1999). In their article, they state that for vicarious learning to occur, it is essential to share the context and other details of the learning experience. In this way, people are able to de-contextualize the learning experience into a more general learning statement and re-contextualize the experience to their own situation. From this, it could be derived that to enable vicarious learning, TransLearning should be based on thick description, reflecting the context of the original learning experience. This is the second requirement.

This description of context, time and place is often found in stories. This makes storytelling a useful tool for vicarious learning (Bowles, 1995; Spouse, 2003 in Roberts, 2010; Klein, 2008). An example of storytelling to support (vicarious) learning is the use of organisational stories to facilitate learning within organisations, referred to as learning histories (Kleiner & Roth, 1996). A learning history is a tool to articulate, describe and communicate experiences from participants and noticeable results to identify success- and fail factors within networks. A learning history does not only describe actions and their results, but also the underlying assumptions and reasoning that led to people’s actions (Kleiner & Roth, 1996). The learning history method consists of several steps, that can be summarised as ‘data gathering’, ‘analysing’ and ‘writing’ processes. During the data gathering phase, observations, document analysis and interviews with key persons, insight is gained in noticeable results including both successes and failure. During data analysing, key themes and plots are distilled from the data. These themes and plots are then validated by the participants and used to construct a learning history (Kleiner & Roth, 1996). The written form of the learning history as developed by Kleiner and Roth uses a two column format, combining unique individual, first hand experiences and its context in detail in the left-hand column, and interpretative comments from other people (often independent process managers) in the right-hand column. In this way outsiders are both able to make sense of the situation and understand choices made and activities employed within the project, and to make their own reconstruction of what happened in the project.
As practice based knowledge is often generated within a specific context and person, no individual view can encompass the whole story of what happened within the project. For outsiders to be able to achieve a complete view of the project, it is important to include the perspectives of a variety of people involved within one project, as is done in learning histories (Kleiner & Roth, 1996). Moreover, the activities and events within a project are subject to ‘multiple interpretability’, implying that the interpretation and meaning of a specific activity within a project may differ between project participants. Learning histories thus seems to be useful tools to facilitate vicarious learning, and therefore the third requirement states that the TransLearning system should include the experiences and understandings of multiple actors involved in one project, represented in the actors’ own words.

Our experiences with using the learning history method, showing multiple perspectives in a written document, within projects indicate that the written learning history is not well received by all stakeholder groups and therefore seems not to facilitate vicarious learning (Regeer, 2009). In accordance with this finding, a study of Procter et al. (1999) showed that watching and listening to people is more appropriate for vicarious learning to occur than the reading of documents. Moreover, contextual, tacit knowledge is best communicated through face to face communication and within social networks (Blackler, 1995; Regeer, 2009). However, face to face communication is a form of synchronous communication, which requires that people are at the same place and time, virtually or real time, and is therefore time intensive and in some cases even impossible. Altogether, these experiences and theoretical foundations show that another form of disseminating and communicating practice based knowledge is needed to support vicarious learning.

In order to stimulate the sharing of practice-based knowledge we tried to combine the advantages of both learning histories and face-to face communication by recording learning experiences on film. The rationale of developing an audiovisual learning history was based on several aspects. First, with film it is possible to show more of the original context of the learning experience, such as the original learner. Secondly, by using film you can see and hear the original learner telling his or her learning story. Because of this, the learning story gains authenticity, which invites people to use the learning material. This is based on the observation of inter alia Cairncross and Mannion (2001), that the use of video and audio may increase enjoyment and engages a user in a way that static material, such as a report, does not. Third and last, a study of Paivio (1975) shows that people recall pictures better than words. He referred to this as the picture superiority effect and states that this could be explained by the fact that pictures
and videos leave a stronger imprint than words and pictures are easier to understand than words (Paivio, 1975; Najjar, 1995). From this, we hypothesised that audiovisual learning histories are able to transfer contextual, practice-based knowledge in such a way that they facilitate vicarious learning within and between innovation projects. Therefore, the fourth requirement regarding the content of the TransLearning system is formulated as: The TransLearning system should be based audiovisual learning stories implementing the learning history principles.

In this section, we formulated four requirements regarding the content of the TransLearning system, but what should this multimedia system look like to stimulate vicarious learning? What technical characteristics should be included? These questions are answered in the next section.

4.3 Design principles regarding the technical aspects of TransLearning

The design and functionality of the TransLearning system evolved during the project and started from a search in multimedia and learning literature for theoretical perspectives on how (vicarious) learning through multimedia is effectively facilitated. This literature search resulted in the formulation of four design principles as a theoretical framework for the design and functionality of the TransLearning environment. These principles, reflected in Table 4.1, are based on the Cognitive Theory of Multimedia, developed by Mayer (1999) and Mayer and Moreno (2002), which is often used to inform the design of computer assisted instruction materials and E-learning environments (e.g. She et al., 2009; Ponpaipan et al., 2011; Tasir & Pin, 2012).

The first design principle, derived from the Cognitive Theory of Multimedia, implemented in the TransLearning environment is the multiple representation principle, implying that information is more effectively communicated when it is represented in both words and pictures. Several studies show that a combination of pictures (or video), words and audio results in an optimal learning effect (Cairncross & Mannion, 2001; Mayer & Moreno, 2002). Another reason to combine animation, auditory narration and onscreen text is that learners differ in the way in which they prefer to gain information. This is referred to as the ‘learning preference theory’ (Cairncross & Mannion, 2001). When combining pictures and words, spatial and temporal continuity should be considered.
Table 4.1. Design principles TransLearning system.

<table>
<thead>
<tr>
<th>Design principle</th>
<th>Sub-principles</th>
<th>Practical implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple representation principle</td>
<td>Spatial continuity</td>
<td>Combining video, audio and text</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presenting text next to video</td>
</tr>
<tr>
<td></td>
<td>Temporal continuity</td>
<td>Presenting text simultaneously with audio</td>
</tr>
<tr>
<td>Preventing cognitive overload</td>
<td>Chunking principle</td>
<td>Short film fragments with maximum length of appr. three minutes</td>
</tr>
<tr>
<td></td>
<td>Rule of coherence</td>
<td>Presenting a selection of the whole story</td>
</tr>
<tr>
<td>Promoting constructivist learning</td>
<td>Options to search for relevant fragments</td>
<td>Fragments are potentially connected by sets of keywords</td>
</tr>
<tr>
<td></td>
<td>Options to construct a personal story</td>
<td>Fragments are potentially connected by sets of keywords</td>
</tr>
</tbody>
</table>

Both in time and distance users should be capable of making connections between text and pictures (Mayer, 1999; Mayer & Moreno, 2002). Within the TransLearning web environment, the multiple representation principle is implemented by combining video, audio and text, so that people are able to listen, watch and read the presented information. While the film fragment is played off, an annotation track is visible next to the film fragment (see Figure 4.1). The annotation contains a literal reflection of the spoken words and is shown simultaneously with the audio.

Figure 4.1. Screenshot of a film fragment from the TransLearning system, with on the left the film fragment, and on the right hand side the annotation.
A principle that can be considered as a direct consequence of the multiple representation principle is the importance of *preventing cognitive overload.* A danger of simultaneously presenting audio, video and text is that visual representations video and text compete for visual attention of the user, i.e. the ‘split attention effect’ (Mayer, 1999; Mayer & Moreno, 2002). This effect is caused by an overload of the visual working memory (Cairncross & Mannion, 2001). Cognitive overload may be prevented by applying the rule of chunking, which implies the reduction of the amount of information that is processed by one of the two information channels, by splitting up long film fragments into small clips or by reducing the amount of words in the annotation. Another way to prevent memory overload is to reduce extraneous material which is referred to as the rule of coherence (Mayer, 1999; Mayer & Moreno, 2002). Both chunking and the rule of coherence are applied within the TransLearning web environment by offering only short film fragments with a maximum length of approximately three minutes and by including not the whole stories (interviews), but only a selection including the relevant stories and learning experiences. This resulted in a hundred film fragments that are individually visible on the TransLearning system, as is reflected in Figure 4.2.

![Figure 4.2](image-url)

**Figure 4.2.** Screenshot of a part of the TransLearning homepage. Each ‘talking head’ reflects one short film fragment, with a maximum length of approximately three minutes.

A third principle that is related to enhancing the learning effect of the TransLearning system is the importance to *promote constructivist learning.* Constructivist learning is a rather broad concept. In the context of this study, we followed the following definition: “meaningful learning occurs when learners themselves actively select relevant information, organize it into coherent representations and integrate it with other knowledge” (Mayer, 1999, p615). For constructivist learning to occur it is important
that users are able to select the relevant images and sounds and link them with prior knowledge and experiences.

The keywords attached to the film fragments may be used as selection criteria to select relevant material. These selection criteria are formulated inductively from the material and are divided into three main categories, viz. ‘project’, ‘person’ and ‘content related keywords’ (see Figure 4.3). After clicking on a selection criterion, only the film fragments that are linked to that specific keyword are selected. From this selection, the user may select the fragment he or she wants to watch. Since a film fragment may be linked to more than one keyword, the user can narrow down the number of film fragments by using a combination of selection criteria (keywords) - only the film fragments that include all used selection criteria are shown.

Figure 4.3. Screenshot of the (Dutch) keywords (tags) used within the TransLearning system. In the right upper corner of the system a search engine is included, that searches for relevant film fragments in both the keywords and transcripts.

4.4 Methodology

In order to show how the Translearning system facilitates intra- and inter-project learning, we conducted both interviews and workshops. In total, we interviewed 11 persons, who were all involved in system innovation projects aiming for sustainability. The main aim of these interviews was to gain insight in how TransLearning supports individual learning. In addition, we organized two separate workshops to study intra- and inter-project learning that were both attended by five persons. During the workshop on intra-project learning, the workshop participants watched film fragments that included the stories and experiences of people from their own project. In contrast, in the workshop on inter-project learning, the participants looked at film fragments reflecting the experiences from people involved in other system innovation projects. Both workshops were organized with projects in the context of the TransForum network.
Since the TransLearning system consisted of film fragments from three projects and 31 different individuals, we made a pre-selection of the material for each interviewee. This pre-selection was based on a pre-interview with the interviewees to explicate their learning questions, and resulted in a personal playlist containing around 10 film fragments for each interviewee. During the individual interviews, the participants watched the preselected material and were asked to reflect on the material, with a specific focus on to what extent the film fragments were consistent with their learning needs and interests. The reflection on the TransLearning film fragments was guided by questions such as: How is this film fragment useful to you? If not, how could the relevance to you be improved? Did the fragment reflect new insights or knowledge? Given that the interviews were used to study the effect of the TransLearning system on individual learning, whereas the workshops focused on group learning, the workshops followed a somewhat different design. To facilitate the discussion on the film fragments and the group learning process, all workshop participants watched the same film fragments simultaneously. Each fragment in the playlist represented a different theme. These themes were articulated during the pre-interviews with one representative of the project group. After watching the preselected film fragments from the playlist, the participants discussed how the film fragments were linked to their specific project context and what eye-openers they encountered. After the discussion, the film fragments were prioritized by the participants, resulting in a ranking of the themes based on relative priorities. On the topic of the highest prioritized theme more film fragments were shown, which were linked to and discussed in the project context of the participants.

All interviews and workshops within this study were recorded and literally transcribed. The transcripts were qualitatively analysed using an open coding system instead of formulating measurements indicators beforehand, as the main objective of the research is to identify the types of learning initiated by TransLearning rather than to measure the performance of learning. Throughout the coding process the transcripts were independently analyzed by two researchers. In the first ordering phase raw transcripts were cut into relevant fragments that is, the fragments that contained data on the learning effect of the TransLearning system. To each of the relevant interview fragments a conceptual label was assigned, referring to the participant’s view on the learning effect of the film fragments he or she looked at. After analysis, the two researchers rejoined together with the project leader to develop a shared understanding of the attributed labels. This shared understanding of how the TransLearning system facilitates learning is presented in the next section.
4.5 Results

4.5.1 How does TransLearning support learning?

The TransLearning system was designed with the aim to support (vicarious) learning within and across system innovation projects. This section elaborates on the question how TransLearning facilitates learning, which was described as an approach to support system innovation projects. We divided the different effects in three clusters: individual, intra-and inter project learning.

Individual learning

The responses of the participants indicate that individual learning is facilitated by two different modes: through acknowledgement and through generating a deeper understanding. Acknowledgement refers to the recognition of the learning experiences or situations expressed in the film fragments, implying that the user of the TransLearning system recognizes the situation described and relates this to similar situations they encounter in practice. The affirmation that other projects encounter the same problems or describe the same elements as highly important in innovation processes is said to create a feeling of comfort. This feeling of comfort originates from the insight that it is not unusual to experience a specific problem and spending a lot of time dealing with it. According to de Sonneville (2007), acknowledgement is key in learning processes. After acknowledgement, people are able to move on. To capture the essence one participant mentioned: “Yes, it confirms what I experienced and this comforts me somewhat - that I should not worry too much about it”.

Some participants, however, mentioned that, although they appreciated the acknowledgment of problems by others, they felt that in some cases information on the solutions to these problems was too abstract to use in their project or was even lacking. Next to acknowledgment, the description of a similar experience may result in a deeper or more complete understanding of a situation at hand as it may give importance to other aspects or include new ones all together. Since the persons in the film fragments may frame things differently than the user of the TransLearning system and uses different wordings to describe a situation, the user gains a deeper understanding of a situation at hand. A participant mentioned: “It is nice to see that the way people frame things always differs from how you give meaning to specific events. The more you see these kinds of differing interpretations or meanings, the richer your image and understanding of a specific event will become.” This implies that the TransLearning
system stimulates users to relate the information in the film fragment to their own knowledge and experience base, which is an important aspect of constructivist learning.

**Intra-project learning**

The analysis of the experiences and responses of the participants during the group sessions show that group learning is facilitated by different modes. First of all, a distinction can be made between learning within projects (intra-project learning) and learning between projects (inter-project learning). We will first elaborate on how TransLearning facilitates intra-project learning.

During the process of development, a first prototype of the TransLearning system was used in an intra-project learning setting. The main aim of this session was to share the different perspectives and values of the people involved in the project and to reflect on the differences and similarities between these perspectives. This allowed the project members to discover to what extent their values were shared by the others and stimulated the discussion on the Triple P Value Proposition of the business developed within the project (de Wildt-Liesveld et al., 2013). To this end, film fragments with the ‘dreams’, insights, perspectives and visions of the different project members were shown. The results of the workshop suggest that the use of the TransLearning system during the workshop supported intra-project learning in two interrelated ways: via the *articulation of different perspectives involved* and *facilitating reflective awareness*. In the context of intra-project learning, reflective awareness both involves *reflectivity towards the own view of the participant* and *reflectivity towards the views of others* involved in the project.

The experiences of the participants suggest that TransLearning facilitates intra-project learning by making explicit the insights, perspectives and visions of the different project members, illustrating the concept of ‘*multiple interpretability*’. The TransLearning system captures the personal perspectives and visions and makes them available to project members. The project members participating in the workshop stated that watching the film fragments made them aware of the perspectives and visions of the other project members concerning the project. Becoming aware of and understanding each other’s perspectives and visions involves a learning process and is essential when working together within a system innovation project. In addition, the explication and articulation of the perspectives held by the different project members facilitates reflective awareness; learning about, and collectively reflect on, the different
perspectives within the project. Only when it is known what a specific perspective encompasses, project members can determine through a process of internal reflection how these perspectives differ and what they have in common. This implies that facilitating reflective awareness is an important step in working towards a common goal.

Reflective awareness may also be supported when project members view their own perspectives, visions and learning experiences formulated in the past. At first, being confronted with their own views makes them aware of the perspectives they adhere to within the project. Moreover, by comparing a perspective at moment A with a perspective at moment B, gradual changes in visions or working methods become visible, as one project member illustrates: “This is brilliant! That you occasionally reflect upon the development… A project is changing every day, but you don’t notice it as it goes gradual, very slowly. But if you sometimes look back to film fragments and you hear yourself talking about what you then thought. Then you think: ‘did I say that? Did I really think that?’ Those simple things, then you see that it is a confronting medium to show what changed.” This shows that to facilitate learning by comparing the current situation with past experiences, it is essential that on several moments in time, individual interviews with the project members are conducted and are put on film.

**Inter-project learning**

How does TransLearning facilitate inter-project learning? To answer this question, we organised a workshop in which the participants watched film fragments showing the story and experiences of people within other system innovation projects. The results of this workshop show that learning between different projects may be facilitated in three different ways. As in intra-project learning settings, TransLearning supports reflective awareness during project learning processes. Reflective awareness includes for example reflecting on, questioning and adapting the own project’s current direction, ways to deal with problems, or past decisions and is initiated via the TransLearning system by delivering new insights regarding system innovation processes and providing new directions to search for solutions. The process of reflective awareness is facilitated by watching relevant learning experiences of project participants of other projects and re-contextualising these experiences to their own project context. This is accomplished by asking questions such as: Does this also apply to our project? How is this similar or different from our situation? Do we also need to pay attention to these aspects in our project? In most cases this reflection started naturally after collectively watching a film fragment but was further stimulated by the facilitator of the workshop.
An example of reflective awareness comes from a workshop where a participant picks one sentence out of a film fragment introducing the direction of a project: “The need for change must originate from the community itself”. She continues to reflect on her own project: “What is the common need in our area? Last summer there was a problem with the fruit being too cheap. There are a lot of people who perceived this as a problem. Are we going to do something with this? We could direct some actions towards this. But we also decided that dealing with such issues may slow down the innovation process. This is actually a bit strange, since the project is started to come up with solutions for problems people encountered within the area.” This example shows that watching the film fragment reflecting the experiences from another project, resulted in reflective awareness and internal discussions on how their own project gets direction and questions former decisions. Through these reflections and discussions, participants are stimulated to re-evaluate conventional processes within the project, an important step in a learning process.

Moreover, through the learning experiences available via TransLearning, project members gain insight in new relevant aspects regarding system innovation processes to apply within their own project. One participant for example, responded to a film fragment in which a person explains that it is, for a system innovation project or process to become successful, important to have an appealing project image or story towards society. He stated that this importance was quite new to him. Another participant acted in response: “I see an interesting connection to another fragment in which someone mentions the importance of recognising that you are stuck. We are for example stuck with the project image. We don’t have a visionary involved in the project or an appealing project image or message. I think that we are really stuck at this point but we don’t recognise or mention it explicitly.” This discussion in relation to the film fragment shows that different project members merged the experiences explicated in several film fragments into new relevant insights for their own project. These new insights are generated via a process of de-contextualising the learning experiences and applying it to their own project, showing that the TransLearning system stimulates constructivist learning. The newly generated insights formed the basis for reflection on the practices and activities within their own project. The reflection on current practices may eventually result in a change in the activities and strategies applied within the project. This shows that TransLearning may make new aspects and the implications for the participants’ own project visible and open to discussion, thereby generating new knowledge to apply within their own projects.
A third way in which TransLearning supports reflective awareness and learning is by providing new directions to search for solutions to a known challenge within the project. One of the learning questions of the project participating in the inter-learning workshop articulated during the pre-interview, concerned the lack of a clearly defined project identity. We therefore selected learning experiences on the TransLearning system that included different aspects of a shared identity. In one of the selected film fragments a person mentioned that the identity of their project represented a feeling, and that it is important to work from a common feeling. With this in mind, the participants tried to define a feeling that represented their own project. During the discussion on the common feeling of the project, the project members realised that the variety of people involved makes it difficult to define one feeling that represents all stakeholders involved in the project. Even though no concrete solutions were formulated, and the search towards a jointly formulated identity continued after the group session, the new approach to find a solution provided the project members with renewed energy to discuss a persistent problem and search for solutions from another angle.

Although the participants acknowledged that TranLearning facilitates inter-project learning indirectly by stimulating reflection and discussion within the project, they missed the direct learning effect of gaining new knowledge or insights. More specifically, they said the action or solution perspective is lacking in some of the current film fragments. One participant stated for example: “This woman mentions that trust is very important in transition trajectories and that she experienced that within her project participating parties distrusted each other. But she doesn’t tell how she dealt with this issue of distrust. What did she do to make the parties trust each other? This how-perspective is lacking in some film fragments... The film fragments end when it becomes interesting.” According to the participants, the lacking of an action perspective could be caused by the fact that the film fragments are kept very short, while it is very difficult for people to make a core statement in such a short time frame.

4.5.2 Individual learning versus learning processes within groups

At the start of the project we assumed that the TransLearning system would be most valuable in learning processes within an individual setting, also referred to as learning from a free choice setting (Falk & Dierking, 2000). We therefore designed the TransLearning system as an open and flexible system, providing the user with maximum freedom of choice and control. However, during test-sessions we observed that individual users got lost in the wealth of film fragments and keywords present in
the TransLearning system. Moreover, many participants mentioned that they lack time to browse freely through the system in the search for relevant and interesting learning experiences. These observations suggest that the individual use of an open system with a large degree of freedom is more effective when the user has a clear articulated question with a certain sense of urgency to solve it.

This clear articulated question and sense of urgency was shown to be more on hand in groups. Arranging a group setting with the objective to reflect on challenges currently faced within the project opened up a time-window to use the TransLearning system to deal with the issues at hand. In order to select the film fragments and learning experiences that match the challenges faced within the project, the learning questions and challenges of the project were articulated by interviewing one or two project members beforehand. This pre-selection of relevant film fragments enhanced the purposefulness of the discussions during the group sessions. Taken this together, the experiences with both individual use and the use of TransLearning in group settings show that the most valuable context of use of the TransLearning system appears to be within a group setting. This observation is in agreement with the statement of Bradbury and Mainemelis (2001) that conversation is an important step in learning, since it integrates both reflection and action. The integration of reflection and action is necessary to transform (vicarious) experiences into knowledge (Bradbury & Mainemelis, 2001).

### 4.5.3 TransLearning aspects that contribute to the learning process

Next to the perspectives on how TransLearning facilitates (vicarious) learning, the participants of this study also explicated the aspects of the TransLearning system that, according to them, contribute to the learning processes described above. Responses of the participants during the interviews and workshops indicate that the ‘reality value’, a term we assigned to the material, is an important feature of the TransLearning system that contributes to the learning effect. Analysis shows that the reality value comprises two different aspects; *authenticity* and the *display of life-like features*.

When we asked the participants to describe the added value of the film fragments in the TransLearning system, they often referred to the practical aspect of the learning experiences. All learning experiences and examples referred to in the film fragments are based on practical knowledge, acquired in real life situations. This real life context is described by a participant as: “The film fragment includes an example from practice, it is someone who really experienced it. That adds something”. Another participant
formulated it as: “They talk about practice- these people are close upon it” and “You can really see where the experience comes from”. These quotes suggest that the participants appreciate the fact that the experiences rely on real life situations, instead of on theoretical knowledge and reflections. The real life context of the learning experiences in the TranLearning system is in literature referred to as ‘authenticity’. Resnick states that any form of education is inadequate where learners are removed from authentic situations (in Herrington, 1997). Instead, knowledge should be offered in a context that reflects the way knowledge and skills will be used in real life situations.

Reflecting on the value of audiovisual material, participants also referred to the nonverbal signals that are visible in the film fragments as an important feature of the TransLearning system. Within this context, these nonverbal signals include intonation, gesture and facial expressions. One specific nonverbal signal that is mentioned by some of the participants is the energy and passion the speakers talk with. According to the participants, these nonverbal signals are important in defining the meaning of the spoken words as one of the participants explained: “The shape of the message determines the content of the message as well.” This meta-information is important in valuing the content of the learning experience, as referred to by another participant: “You can see it in the way they are talking. It is some kind of meta-information you acquire. It is not about the things they are telling as I also say these things. It is about the meaning these people give, how they are involved and which examples they give. I think that when you are looking through the film fragments you get additional information on that topic that you cannot derive from a piece of paper.” This quote indicates that the meta-information reflected in the nonverbal signals gives information on the meaning of the words the speaker is using.

Within literature, the non-verbal signals, such as linguistic expressions, speech styles, accent, voice, gesture and facial expressions, are referred to as ‘life-like features’. Research shows that these non-verbal signals are important factors that affect both interaction and learning as they enhance believability and communication efficiency (Chittaro et al., 2005). The aspect of believability is described as the perceived plausibility of the provided information, whereas communication efficiency involves the cues on the state of the dialogue. This implies that ‘life like features’ signals give important meta-information on the content of the story that influences the learning effect (Chittaro et al., 2005).
In sum, the experiences of participants indicate that the authenticity of the learning experiences reflected within the TransLearning system, and the display of life-like features are important aspects that contribute to the learning processes that are initiated by the TransLearning system.

4.6 Discussion

4.6.1 Conclusion: How does TransLearning facilitate vicarious learning?

Practice based and embodied knowledge is difficult to communicate to, and share with others, because of its embedded and context specific nature. However, sharing practice based knowledge is an important aspect of system innovation projects as it evokes learning. This raises the question how tacit knowledge is communicated in such a way that learning is facilitated. We developed the web-based tool TransLearning, an online system that archives film fragments with the learning experiences of people involved in system innovation projects, as an answer to this question. Based on theory on vicarious learning and multimedia theories, we formulated requirements and design principles that formed the basis for the content and technical features of the web-based system. This chapter addressed the question to what extent and how the TransLearning system facilitates individual, intra- and inter project learning, from the perspective of vicarious learning.

The results of both the interviews and workshops suggest that TransLearning facilitates learning in both individual and group settings. We distinguished several ways in which the TransLearning system supports learning. In an individual setting, TransLearning may facilitate learning via acknowledgement and generating a deeper understanding of an issue at stake. Next to individual learning, TransLearning may also support group learning processes, both intra- and inter project learning. Intra project learning is said to be facilitated through the articulation of the different perspectives of the project members involved and by facilitating reflective awareness, both towards the own view of the participant and the views of others. In addition, TransLearning may also facilitate inter-project learning through supporting reflective awareness within a project by delivering new relevant aspects regarding system innovation processes and providing new directions to search for solutions. Two factors that are identified by the participants as being essential in supporting these learning processes is the reality value of the material, including both authenticity of the experiences and the display of life-like features.
Although the results of this study show that TransLearning may stimulate individual as well as group learning, our experiences with using the TransLearning system indicate that the collective reflection activities appeared to be especially conducive to the learning process.

4.6.2 Limitations of the TransLearning system

Although we consider TransLearning as a useful tool to stimulate individual, intra- and inter project learning, we identified some limitations with regard to the TransLearning system. The main rationale of the TransLearning system is to disseminate learning experiences and practice-based knowledge in such a way that it enables outsiders to re-experience the experiences of others by reflecting the context of the original learning experience. However, the reactions of the participants show that it has been difficult to include this context aspect in the TransLearning system fully. The story is told by the person who experienced the original experience, but you don’t see the actual ‘real’ experience. To include more context of the ‘real’ learning experience, more film material of the surroundings or environment could be incorporated in the short film fragments. This however, would require extensive editing of the raw material, thereby increasing the time effort. The question of offering the “real” experience, in this study referred to as authenticity, also raises an additional dilemma. Editing the material to reconstruct the original experience would at the same time mean manipulating the original story. In this study, we didn’t edit the film fragments since we wanted the personal stories to be authentic and real. It would be interesting to study whether a more directive reconstruction of the learners’ stories would enhance or inhibit contextual learning.

Furthermore, the original learner told their stories from their own learning perspective, and not from the learning question of the user of the TransLearning system. This implies that film fragment should be mounted and edited from the perspective of the user to reconstruct complete stories including an action perspective with regard to a specific subject or topic, although this is in contrast with the maintenance of the original story. More research is therefore necessary to determine how a complete story can be reconstructed, while maintaining authenticity and the original story.

The third lesson learned is also related to the original story and concerns the consideration between the authenticity and general validity and legitimacy of the learning experience. The film fragments in the current TransLearning system present personal stories regarding events within a project. It is often not clear to what extent
this personal story is true for all project members. To increase the general validity and legitimacy of the learning experiences and practice-based knowledge, one should include the personal stories of several project members regarding one specific topic or event within the project. These film fragments should be linked to each other through key words, so that all personal stories can be watched successively. In this way the user has the opportunity to gain insight in the different perspectives of the project members concerning a specific subject.

While the aspects of the TransLearning system mentioned above are important for the successful facilitation of learning, clearly the biggest challenge is to motivate people involved in innovation processes to share their learning experiences and practice-based learning via the TransLearning system. In literature, the willingness and motivation for people to share knowledge with people is one of the main challenges in fostering a virtual community or knowledge management system, (e.g. Hislop, 2003; Chiu et al., 2006; Al-Busaidi et al., 2010; Chen & Hung, 2010). To resolve this challenge, it is important to study the motivations behind people’s knowledge sharing in virtual communities in general (Chiu et al., 2006), and the TransLearning system in specific. Several studies show that both social aspects, such as social interaction ties, trust, norm of reciprocity, identification, shared vision and shared language, and outcome expectations engender knowledge sharing in virtual communities e.g. Chiu et al., 2006. Moreover, organisational- culture dimensions (Al-Busaidi et al., 2010; Chen & Hung, 2010) and system technical characteristics (Al-Busaidi et al., 2010) are also shown to affect knowledge sharing behaviour. Further research is necessary to study if these aspects also apply to TransLearning, and whether other motivational factors are also affecting the successful sharing of learning experiences and practice-based knowledge via the TransLearning system.

Based on the outcomes and lessons learned of this study, the TransLearning system has been further developed and refined and applied within several different projects and contexts. We, for example, experimented with using the TransLearning system to support the sharing of knowledge within the context of specific, once only, events, such as conferences. During the Metropolitan Agriculture Summit in 2010 we filled up the TransLearning system with experiences of the conference participants. The TransLearning system made it possible to sustain the unique arrangement of people, knowledge and experiences for a longer period of time. Moreover, we used the TransLearning system in training and teaching programs. Further research should reveal whether and how the application of the lessons learned in other contexts of use, influenced the learning effect of the TransLearning system.