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‘It’s in my hands’

Analytical tools for the communication of craft knowledge

ABSTRACT

Craft knowledge is built from examples of experience, and when experiences from many people are gathered and compared, new knowledge is developed. This requires either socialization between practitioners or a systematic collection of practice descriptions, such as in a manual. However, there is always a risk that knowledge that is difficult to put into words will never be communicated. The aim of this paper is to show how theoretical perspectives can be used as analytical tools to help us develop methods that support the communication of craft knowledge. Using an approach of research through practice in the field of gardening, and combining a tripartite theory of knowledge with a SECI-model analysis, I will discuss how it is possible to make practitioners’ subjective knowledge more readily available to others.

Keywords:

craft, knowledge communication, documentation, practice theory, SECI-model

INTRODUCTION

The professional gardener and peony grower, Hermann Krupke, described to me the way to divide a peony plant by both telling me and showing me what he does. His method is to divide a plant into several parts in such a way that the new parts will develop as well as possible, providing sellable plants. He described to me the different steps and drew my attention to what he thought was important. An example of the latter was that he cut the withered stems to a length that enables them to protect the newly emerged fragile buds while he is working. On one occasion, when I asked him how he assesses where to divide the plant, he replied: “It’s in my hands.”

There are various reasons why personal knowledge and knowledge linked to craftsmanship are difficult to articulate. In this paper, I want to show how theoretical perspectives can be used as analytical tools to help us develop methods that can strengthen the awareness of personal and situational experiences in the communication of craft knowledge.

Knowledge in our hands

Hermann Krupke makes his decisions according to what he sees and feels when dividing the peonies. His sensory impressions are his tools. Through many years of practical experience, he has developed an efficiency and a rhythm in his work, partly because he does not have to consciously register each step of the process anymore. This is a knowledge that has become so obvious for its bearer that it no longer needs attention.

The term ‘knowledge in the hands’ has been used by the philosopher Maurice Merleau-Ponty (2012/1945, p. 127) to describe what he perceives as knowledge that is incorporated into the body – so-called “embodied knowledge”. Essentially, the body knows how to act due to extensive repetition of a bodily practice (Tanaka, 2013, p. 48). Researchers in different fields – for example, phenomenology, art and design practice, and pedagogy – have investigated what is representative in this realm of knowledge and how it is communicated to others (O’Connor, 2009; Fourcade, 2010; Tanaka, 2013; Groth, 2017). For example, sociologist Marion Fourcade defines embodied knowledge as ‘a form of knowledge that cannot be easily dissociated from the personal qualities of its bearer’ (Fourcade, 2010, p. 570). Despite many in-depth studies, it still seems necessary to clarify that even though this knowledge is referred to as embodied, or tacit, it is not something that just goes on in the hands without the input of a person’s mind. Social anthropologist Tim Ingold emphasizes this in a discussion about skilled practice, in which he questions the perception that skill is wordless (2018). Ingold argues that it is also possible to ‘tell’ through practice and experience (Ingold 2013; 2018). It should be said that the conversation Hermann Krupke held with me included many words, both when I was observing and when we were working side by side. However, he did not only use words when he was describing his method; the communication also involved the materials in front of us and our actions.



FIGURE 1. The peony grower Hermann Krupke is telling how he divides a plant. He does not only tell through words, but also through his practice. Image by the author.

Documentation of plant propagation practice

Materials and actions that facilitate knowledge transfer in a practical situation are difficult to represent in a manual. In my research, I search for effective methods for the documentation and communication of knowledge in craft practice. In my doctoral study, I explored this in relation to the gardener’s knowledge of plant propagation, with a special focus on the propagation of perennials using vegetative methods (Westerlund, 2014, 2017).

Written sources provide many descriptions of methods for plant propagation; however, on closer inspection, these are often an insufficient representation of the actual knowledge used. Alongside the challenges with communication already mentioned, another challenge in the documentation of propagation practices lies in the great diversity of working methods due to variations in how plants grow. In addition, differences in personality and context can also drive variations in practice. In presenting his practice theory, Donald Schön describes how ‘the reflective practitioner’ builds his own repertoire of experience examples which can then be applied to specific situations (Schön, 1995). A gardener’s propagation knowledge is based on comparisons of practical cases of different plants and their stages of development. This knowledge can be communicated by giving examples, but an entire repertoire of experiences, accumulated by the individual gardener, is impossible to document. It is a unique form of knowledge that can be born from the experience of an entire working life (Rust, 2004). I regularly receive comments that it is not possible to convey everything that is part of someone’s personal knowledge, and I agree. Nevertheless, I argue that documentation of craft knowledge has an important function, partly because if documentation is based on examples of many different people’s experiences, then it increases opportunities for knowledge development, but partly because the challenge of documenting is also a way of being forced to learn to communicate personal knowledge to others.

I am a professional gardener, as well as a teacher and researcher within the field of craft, and I use my own craft knowledge in my research. This often involves my own participation in the given practice that I am studying – a methodology which is used in different fields of practitioner research (e.g., Niedderer & Reilly, 2010; Sjömar, 2017; Mäkelä & Nimkulrat, 2018). The methods that I used in my PhD-study included observations and participant observation at perennial nurseries and botanical gardens, where propagation is still part of the business. I tested how the knowledge is communicated, both in the role of the teacher and the one who takes part of the knowledge that is conveyed. I became aware of how much of personal knowledge lies in sensory evaluation, but also that knowledge development is largely a social construction. This has made me more interested in how knowledge communication goes on within different professional garden contexts. I call them “communities of practice,” a term used in studies of situated learning and social practice (e.g., Lave & Wenger, 1991; Lave, 2008; Gheradi, 2009).

It is not new that socialization between groups of practitioners results in communication. What I consider is that there is a need to create a methodology which will further develop the communication of personal and situational knowledge. In my doctoral study I used a theoretical framework in the search for documentation methods. This framework was also a way of understanding what kind of knowledge was under study. The thesis was written in Swedish (Westerlund, 2017), so, with this paper, I want to highlight the theoretical perspectives that I used within that research. The research question here focuses more specifically on the use of analytical tools: *How can theoretical perspectives and analytical tools support the development of methods for communication of craft knowledge?* I will try to answer this question by performing an analysis of two different cases of communication in community practices. One is presented in my thesis, but told in another way. The analysis and discussion are new. The other case is taken from a more recent project. In the next section, I start with a presentation of the theoretical framework.

KNOWLEDGE PERSPECTIVES IN PLANT PROPAGATION PRACTICE

Three different knowledge perspectives provided the point of departure in my search for meaningful documentation methods for plant propagation practice: *the object-directed*, *the practice-directed*, and the *subject-directed*. This approach is based on philosopher Bengt Molander's research on knowledge in action (Molander, 2015, 2017).

With the object-directed perspective, I reflected on the knowledge of the conditions required by different plant parts for reproduction. This helped me to form a classification system. The objects chosen for the systematisation were the propagation parts that gardeners use in vegetative propagation. With this hierarchical system, it was possible to describe categories of propagation parts despite a great variety in the plant material. With a classification system like this, it is possible not only to describe various propagation parts but also to gather documentation that represents knowledge in propagation practice. Converted into an open-source database, this system can be used both for teaching purposes and as a communication tool between professional gardeners.

With the practice-directed perspective, I focused on the problems which occur when propagation practice is explained and communicated separately from the practical situation. I analysed and tested written instructions created by others, and compiled my own descriptions of propagation practice based on participant observations. However, if we are to evaluate an action, we must form experiential knowledge as personal knowledge. The development of knowledge requires attention and reflection *on, or through*, the practice.

The third knowledge perspective, the subject-directed, I understood to be very helpful in exploring the parts of craft knowledge that are not easily articulated and communicated. It also made me reflect on how someone learns, either alone or in relation to others. Subjective experiences and experiences where there is consensus between people are both important to consider because the situation that is under study often consists of both types of experience (Kaiser, 2000). Thus, methods are also needed that can highlight the connection between subjective experiences (personal knowledge) and knowledge we share with others. Therefore, I have also been searching for a tool to analyse the connection between personal knowledge and situations where the practitioners share their knowledge with each other. Others have studied this. In the research field of Knowledge Management, a tool for description of "knowledge conversation" has been developed: the so-called SECI-model (Figure 2). The model is based on the assumption that there is an interaction between knowledge that is not articulated (tacit) and knowledge that is articulated (explicit). To show the different kinds of interaction between these two, four steps of knowledge development are used: *socialization*, *externalization*, *combination* and *internalization*. The following description is my interpretation of the four steps, which builds on Nonaka & Takeuchi's description (1995, pp. 62-69):

- *Socialization* is a form of knowledge development that occurs together with other people, where words are not used. It is possible to gain knowledge by observing, imitating, and performing actions.
- *Externalization* is the situation when personal reflection shifts into shared reflection, for example in a discussion. Words are used to ask questions, and to explain and communicate experiences.
- *Combination* refers to the part of the knowledge building where existing knowledge, communicated in various forms, are combined.
- *Internalization* occurs when someone is performing a procedure in practice with the help of explicit knowledge, like a manual, and thus incorporates the knowledge into the body.

Researchers in the creative and practice-led disciplines (CPD) have also tested the SECI-model with the aim of developing a framework that can help researchers who are building research methodologies (Niedderer & Imani, 2009). The model has received some criticism, mainly because of the definition of "tacit knowledge", with the motivation that it does not correspond correctly to Michael Polanyi's

definition, which is stated to be the starting point (Rust, 2004; Tsoukas, 2003). Polanyi’s definition of knowledge includes the idea that the part of a person’s knowledge that is “tacit” is tacit because it is built on so many experience examples from practicing so that the bearer cannot tell how he or she is using it (Polanyi, 1966, pp.4-5). Note the similarity with Donald Schön’s reasoning about the reflective practitioner who uses his repertoire of experience examples when doing something.

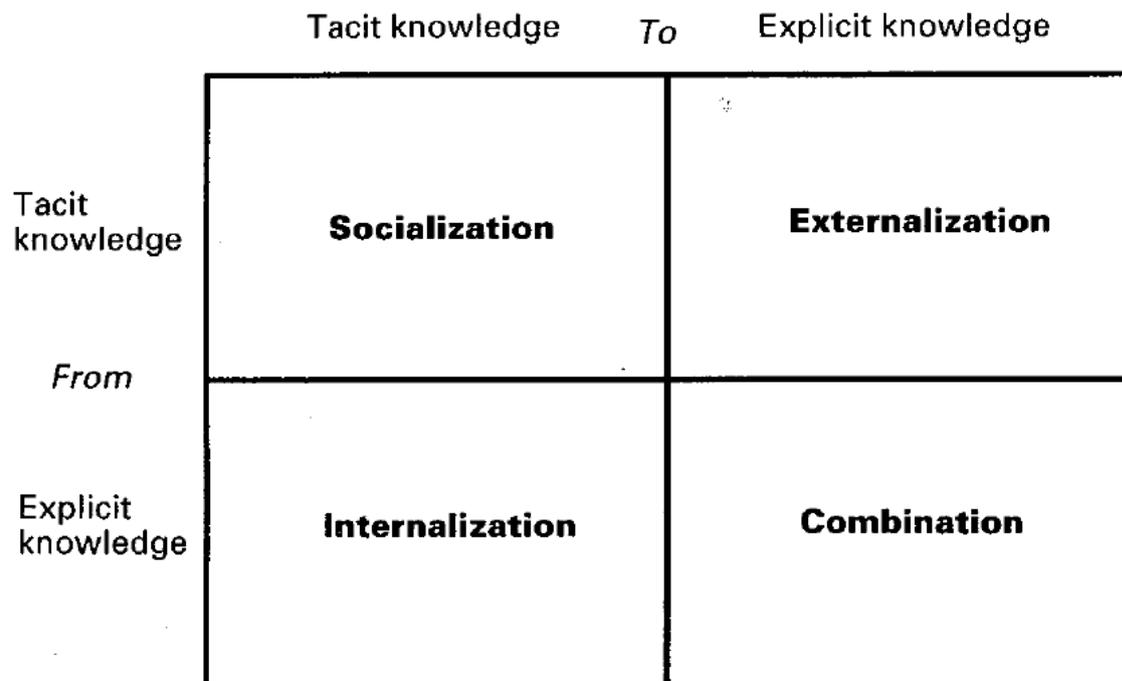


FIGURE 2. The SECI-model (from Nonaka & Takeuchi, 1995, p. 62).

Despite the criticism of the use of the term “tacit” in the SECI-model, I still find the model to be useful because the division of knowledge development into four different steps draws attention to how we learn in practice and how we communicate knowledge in practice. Here, I will not go deeper into this discussion of the concept of “tacit”, but I still choose to use the model in the reflection on how the communication of craft knowledge can be developed further. The model works as a complement to the the subject-directed perspective. I will use both of these theoretical frameworks as analytical tools to reflect over the following two cases of knowledge communication.

COMMUNITIES OF PLANT PROPAGATION PRACTICE

In June 2017, I initiated a workshop with some of the gardeners who work with plant propagation at the Gothenburg botanical garden. Their task was to demonstrate a procedure from their everyday practice. The purpose of the workshop was to get everyone to pay attention to what kind of knowledge they used, and to find ways to communicate this knowledge. Here, I recount parts of what we did and what we talked about during the workshop, interspersed with my own reflections.

It turned out that the easiest way to give instructions was by pointing out things in the material and showing by doing. In most cases, words were also used to describe the actions. Parts of the gardeners’ instructions were about things that are biologically conditioned, such as suitable times for when the propagation should take place in order to achieve a good rooting result. Some of the descriptions and

explanations were referred to as ‘best practice’ – established ideas of ways to do something, like the best length of a cutting, or the fact that a cutting should be prepared by removing some of its leaves. Sometimes, the basis of the best practice was clarified by the gardeners. For example, someone referred to the fact that this was how the work had been done at a previous workplace; another referred to it as something one was told during education. They also referred to information in literature.

We discussed the particular exchanges of experience that take place between botanical gardens in different countries and with other growers who have a special interest in a specific plant genus. Staff members will sometimes travel to other countries to take part in work in another garden, or to give lectures about their own cultivation experiences. It is in these often institutionalized – but nevertheless social – contexts that the understanding of best practice is built, and where norms, values and, in some cases, vocabulary are developed (cf. Gherardi & Perotta, 2016).

Gradually, questions came up like: Why do you cut right there? How do you choose which of the shots to take cuttings from? One of the gardeners explained how he stuck cuttings of a cushion-formed alpine plant, *Androsace selago*, into a cutting box filled with pumice. Pumice is used because it forms an airy substrate, while the stones themselves can hold both water and oxygen. The pumice grains were light and rolled towards each other. To encourage the cuttings to settle, he packed the stones by striking the surface with the back of a pencil. When we asked how he assessed when the pumice was sufficiently packed, he first said: "It is a feeling that it has settled." Suddenly he stopped and reconsidered. Then, he told us to listen to the sound that arose when he packed the stone grains with the back of the pen. There was a crackling sound as the loose stones moved towards each other. As he continued to pack the pumice with the back of the pen, he told us to notice that the sound was muted. He stopped and explained that the stones had been packed enough for the cuttings to settle.

Analysis of knowledge communication in a workshop

I will start with a reflection of the workshop activity with the three knowledge perspectives. Some of the knowledge that had been communicated was about the form and the condition of the plant material, as well as explanations of biological conditions such as rooting times and temperature. I see this as knowledge which is *object-directed*. My experience is that these explanations often receive more attention than the knowledge concerning the “how” and the “why”. Even during the workshop, these explanations occupied a significant part of the time. During the workshop, we did not use manuals or other representations of documented propagation knowledge – the knowledge that I see as *practice-directed*. However, by focusing on explanations of how the propagation practice is performed, we used a practice-directed perspective. If we make ourselves more aware of the differences between these two perspectives, the possibility that we pay more attention to the knowledge that comes with the practice increases. The intention with this workshop was to pay extra attention to personal knowledge that may be difficult to notice and that may be difficult to articulate in words, to use a *subject-directed* perspective. In order to analyse these knowledge conversations, the SECI-model is used.

As you will recall, the SECI-model involves four steps of knowledge development: *socialization*, *externalization*, *combination* and *internalization*. The gardeners, who work together, seldom give instructions to one another, but regularly give instruction to new employees and apprentices. Their everyday work is relevant to the first step of knowledge development – *socialization* – because knowledge of their gardening processes is being developed in practice together with others in a wordless conversation where knowledge communication takes place through observation and imitation of one another.

The workshop situation is an example of the second step of knowledge development – *externalization* – where reflections are shared. We used words to tell and ask each other about practice and material. However, we did not practice the procedures together. Despite this, there was a communication of knowledge through the observation of the material and the actions being performed. Propagation knowledge has been made explicit in various ways. A knowledge conversation which takes place in a workshop that includes practice is also an example of *socialization*, even though it might only

involve the practice of only one person. This makes it possible to reflect *on* practice. In a situation where the conversation takes place separately from the practice, the need for communication with words increases.

We also talked about experiences from both the past and the present. By doing so, the knowledge conversation has moved into the third step – *combination* – where articulated knowledge is combined. By sharing experiences – our own, and those of others, represented by explicit knowledge in literature, blogs, retold stories, and so on – we compared and combined knowledge.

The fourth step – *internalization*, when someone incorporates a combination of explicit knowledge by practicing – was never a part of the workshop. That step could only be fulfilled the next time one of the participants found themselves in a similar working situation. In a workshop where all participants also try out what is instructed, the shared reflections would probably deepen. Yet, we had begun to practice focusing our attention on how the sensory judgments were used, and how this information could be communicated. This time it became obvious that it is not just the visual impressions that can be used in communication of craft knowledge.



FIGURE 3. Video recording with the gardener Marika Irvine explaining how she chooses the cutting material of a special clone of *Dionysia*. Filmed by the author at Gothenburg botanical garden, June 2016. Captions in english are available. **To watch the video, click the picture**

During the workshop, I filmed demonstrations and conversations. Sound recordings and video could thus capture the gardeners' explanations while they were working with the material. In a knowledge communication that takes place separately from practice, this can be a method for approaching explanations of sensory assessments, such as the feeling of the elasticity in a plant in the search for the best cutting material (Figure 3). If it is a sound that is used to make an assessment in the work, then the sound should be noted in a description. To be able to reproduce such descriptions, the right media is required. Here, video is a useful tool (cf. Wood, 2014; Groth, Mäkelä & Seitamaa-Hakkarainen, 2015; Groth, 2017).

Even though it is important that we try to communicate via different forms of media, a system is needed to make the information available to others for further processing. In this case, the videos, photographs, recorded sounds, or texts that represented some of the knowledge sharing of that day could be systematized with the help of an *object-directed* perspective, a classification system of plant parts that gardeners use in vegetative propagation.

SOCIALIZATION AROUND A SPRUCE HEDGE

The next example represents another community of practice within gardening: the management of spruce hedges. Management of hedges was one of the themes that we highlighted in the project *Platform for curatorial gardening in historic parks and gardens of cultural significance* (Seiler, Westerlund & Almekvist, 2018), initiated by The Craft Laboratory. The project aimed to establish a consensus on good practices in heritage gardening by using six heritage gardens around Sweden as laboratories. The garden objects and management activities in the gardens formed the basis for experiments, discussions, and documentations. One specific “object” we focused on was spruce hedges. The staff at Mårbacka, the former garden of the famous Swedish author Selma Lagerlöf, located in Värmland, needed help in their decisions on the management of a hedge which was over 100 years old.

The use of spruce hedges has a long history in the Nordic countries, but hardly anything is written about their management. The garden literature that mentions spruce hedges is limited and mostly explains the benefits of the compact and evergreen hedges, which protect against cold winds. As one of the project leaders, I started to search for professional gardeners with experience of this traditional garden practice – a practice of which I had no experience of my own. This is a procedure which is more advanced than the clipping of other hedges because if you take just a little too much from the hedge, whole branches will die; if you take too little, the hedge will quickly grow too big.

I visited several gardens and cemeteries, interviewed gardeners, and observed the practice of clipping the hedges. We involved the gardener Hans Nilsson at the Bergius botanic garden in Stockholm. He has many years of practical experience managing spruce hedges. Almost every year, he introduces the practice to someone new from his staff. Some years ago, he began writing a manual as a complement to his instructions in practice. He told me that he rewrote parts of the manual continuously every year, because after he had given his instructions to the staff, and practiced on his own, he discovered details in the practice that he wanted to make more explicit. We started a conversation in which we analysed his manual, talked about practical experiences, validated different instructions, discussed the characteristics of spruce, and the conditions that provide a beautiful and functional hedge. This conversation was prolonged over time. It led to further rewrites of the manual, and gave us a deeper understanding of the hedges and the procedures associated with it.

To increase the opportunities for knowledge development in a community of practice, we wanted to widen our fruitful conversation. We invited people with experience of working with spruce hedges to a seminar at Mårbacka. On this same day, we also visited Fryksände cemetery, in Torsby, Värmland, where we got to share their experiences. Out of the group of sixteen, eight had essential practical experience. Unlike the meeting with the gardeners at the Botanical Garden in Gothenburg, no one was practicing this time. The conversation was based on reflections over the hedges in front of us, and the gathered experiences from each of the individuals with experience of spruce hedges (Figure 4). The communication was mainly done in words, but sometimes the material was used to point out and explain something (Figure 4), like the importance of taking away the accumulations of dead needles to avoid too much moisture and formation of moss. Other explications included bodily movements, as when someone gave a description of how the moving directions during the clipping affects the possibility of achieving a flat surface. At the end of the day, one of the participants said that, although he had a lot of experience in this practice, it had been an instructive day. He said: “We never talk to each other about how we do, in a way like this.”

At the end of the whole project, we published manuals on different garden themes which were written by the gardeners involved in the project. One manual is about the use and management of spruce hedges.



FIGURE 4. The gardener Hans Nilsson, from Bergius botanic garden, is describing his own hypothesis of how much it is possible to cut back a branch in a spruce hedge. Mårbacka, Värmland, September 2017. Image by author.

Analysis of knowledge communication around a spruce hedge

This next example of knowledge communication differs from the first in that no one was practicing during the communication. A practice-directed perspective shows that there was not much description of how to ‘do’ in the literature, but when the participants at the seminar met, a lot of these how-to experiences were shared. Some of the talk during the seminar considered the attributes connected to the object, like biological characteristics or the idea of a shape of a hedge. Perhaps an object directed-perspective could be a strategy for making a systematisation of this type of knowledge communication too. However, in this garden field, it is not the same challenge as in vegetative propagation, where there is significant diversity in the material.

Applying the SECI-model to the seminar, it is shown that two of the steps of knowledge development were present: *externalization* and *combination*. The participants used personal and situational experiences and made them available to the others by telling of these experiences. Mostly, only words were used, but occasionally, some of the communication was expressed through words and gestures. In the discussion, various ways of ‘doing’ were presented. Comparisons were made and, several times, a particular way of doing was validated and established as best practice right in that moment.

When I look at the whole process of the spruce hedge study, all four of the steps of knowledge development are represented. Note that the knowledge development process did not start with this project, nor does it end here. A delimitation to some parts of this project’s activities will make it easier to analyse. In the process at Bergius botanic garden, where Hans Nilsson gave instructions to his staff, he did this both with practical instructions and with written instruction (*socialization* and *externalization*). His staff practiced side-by-side with him (*socialization*). They assimilated the information (*combination*), and tried it out in their own practice (*internalization*). Then Hans Nilsson developed his written instruction in two ways: the first, by alternating between the practice of cutting (*internalization*) and the practice of making his experiences explicit (*socialization* and *externalization*); the second, by having discussions with me about how it is possible to tell (*combination* and *externalization*). My part in the process involved much gathering of explicit knowledge (*combination*). I did that by listening to and reading people’s experiences. I also began conversations with gardeners (*externalization* and *combination*). After the seminar at Mårbacka, we continued by telling others, in conferences and meetings, what we had been doing in this project (*externalization*). Last year, I heard from two different gardens that they had implemented some of the knowledge that came out of this knowledge conversation (*combination* and *internalization*). The knowledge development in this community of gardening is to be continued.

SUMMING UP

The development of knowledge in practice always requires attention and reflection *on*, or *through*, the practice. This does not mean that craftsmen always pay attention to how knowledge in practice can be communicated. Often, we get better success in our communication the more similar experiences we have, but at the same time there is a risk that the more experienced someone is, the less the need to provide explanations for understanding (Kaiser, 2000). In order to be able to articulate our personal knowledge, we must practice paying attention to what knowledge and assessments are used, and we have to practice telling them. The more that personal knowledge is noted and recognized, the greater the opportunities to communicate it. It can also be seen in a reversed way. Tim Ingold comments like this: “... the telling of stories is an education of attention” (Ingold, 2013, p. 110). Even if craftsmen can practice this kind of attention by themselves, the possibilities increase by socialization and communication with others.

My intention with this paper was to show how theoretical perspectives can be used as analytical tools to help us develop methods that support communication of craft knowledge. I have done that by presenting and analysing two cases of knowledge communication. The cases come from the field of horticultural craft and are examples of communication in two different kinds of communities in practice. They were selected because the knowledge communication was the main purpose of the meetings. One of them included practicing of craft during the meeting and the other did not.

I have been using two different theoretical frameworks in the analysis. One is a knowledge perspective divided into three: the object-directed perspective, the practice-directed perspective, and the subject-directed perspective. This tool helps to ensure that various kinds of knowledge will be noticed and communicated. The other framework is the SECI-model. This model supports the awareness of the development in different combinations of reflections *on* practice and reflections *through* practice. The analysis using SECI also shows that it is the changes made between the reflection of one's own work and the reflection together with others that support knowledge development. When different experiences are combined and tested, new personal knowledge can be developed.

Socialization between craftsmen is not always common. The organisation of craft meetings is probably the first step in the development of craft communication. Being part of a community of practice can be about acquiring professional competence, both by being able to relate to the norms and principles that have been set up within the community, but also by being involved in developing and defining best practice (Gheradi & Perotta, 2016; Rolf, 2017). This requires skills in communication, something that touches all craft fields.

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