Learning by watching: what we can learn from the Inuit's design learning

Janne Beate REITAN[*a],

[a] Oslo and Akershus University College; [b] Faculty of Technology, Art and Design (TKD)

Abstract: *In this paper, I explore a single case of vernacular clothing design—the learning and practice of design for contemporary Iñupiaq-Inuit clothing made by the women of Kaktovik, North Alaska—and I hope to contribute to a better understanding of design practice and learning in general. Design research has many unexplored areas and one of these omissions is vernacular design—or 'folk' design. In my opinion, professional and academic design may well have something to learn from vernacular design, although this research is about vernacular learning, didactics about what, why and how to learn within the 'making discipline' of clothing design. The study was based on observations, interviews with seamstresses and authorial participation in designing and sewing in conformity with Iñupiaq tradition, and everything was recorded on digital video film. This investigation of Inuit clothing design indicates that learning-by-watching is the most common way of learning. Learning-by-watching is important within learning-by-doing. This concept of learning-by-watching can be seen as a development of both Schön and Wenger's theories of learning, a concept that will probably be of great importance in further research on the learning process of design, from kindergarten to PhD.*

Keywords: *Vernacular design, clothing design, design thinking, learning-by-watching, learning-by-doing.*

---

[*] Janne Beate Reitan: Faculty of Technology, Art and Design | Oslo and Akershus University College | Norway | e-mail: janne.reitan@hioa.no

Vernacular design – Iñupiaq contemporary clothing

The concept of *vernacular design* —or 'folk' design – allows for the understanding and appreciation of designs created without recourse to institutional qualifications in the field of design (Simon 1982 [1970]: 55). This paper is based upon a study undertaken in the Iñupiaq village of Kaktovik, which is not far from the Canadian border on the North Slope of Alaska—a people also known as the North Alaska Inuit (Eskimo)—and the study investigates how Iñupiaq women practiced and learned design as they made modern-day clothing, namely *annuġaaq*[†] with *qupak* trim (Figure 4) (Reitan 2007).

The study was based on observations, interviews with seamstresses and authorial participation in designing and sewing in conformity with Iñupiaq tradition, and everything was recorded on digital video film. The foundation for the study was a review of design research according to the vernacular aspect, as well as documentation of contemporary Iñupiaq clothing design.

Christopher Alexander (1964) writes about design in unselfconscious cultures, which in this research project is termed vernacular design. Interpretations of the vernacular clothing designers discussed here have been inspired by Schön's (1983; 1987) theory of designers as conscious *reflective practitioners*—even though, in this case, the reflexivity happens to be only partially articulated, and for the most part is expressed as actively functioning tacit knowledge[‡]. Moreover, this study also makes use of the social learning theory of Wenger (Lave and Wenger 1991; Wenger 1998), namely his *communities of practice*, and provides a perspective on learning that differs from the conventional one, which is focused on learning in educational institutions. Thus informed, my interpretation of vernacular design and the production of Inupiaq clothes demonstrates how the learning process can be viewed as a 1) *collective* rather than an individual process; 2) how it is *continuous*, with neither a beginning nor an end; 3) how it is *integrated into daily life* and not a separate, discrete activity; 4) how learning is a *result of observation*, in particular *watching*, 5) how it is *not a result of oral or text-based teaching*; 6) how the appraisal of the learning process was *integrated into practice*; 7) how knowledge is *demonstrated through specific practice*, and not theorized, and 8) how knowledge is always *demonstrated in context*.

The designing and design learning of Iñupiaq clothing

It is not difficult to understand why both old and new Inuit skin garments make a deep impression on researchers, as on people in general, because they are often beautiful and elaborately decorated (Figure 3). As a curiosity, I can mention that my sister-in-law Anguyak made a skin *atigi* (outer garment) (Figure 1) of an aesthetic quality that is rarely seen; she even won the World Eskimo Indian Olympics' Native Dress competition on skin clothing when I was in Fairbanks in the summer of 1998. The trims on these skin garments are improvisations on tradition, which implies the constant creation of new and different patterns. Anguyak, inspired by my master's thesis on the traditional knitted Norwegian Selbu mittens (Figure 2) (Reitan 1992) as symbols of Norway, and as the wife of my brother, a Norwegian, she made patterns on the trim of this atigi based on the eight-petal rose common on the Selbu mittens.

[†] The letter written *ġ* as in *annuġaaq* is pronounced as a kind of *r* in the Iñupiaq language. This means that this word is the origin for *anorak.*
[‡] Thomas Kuhn (1970), who refers to Michael Polanyi's (1983 [1966]) concept of *tacit knowing.*

However, there are few Iñupiaq women who actually make skin garments anymore. Skin and fur are no longer materials for everyday use; they are even rare for ceremonial occasions. If I had followed the tradition of the researchers on Inuit clothing by focusing on skin clothing, I would not have been able to observe and watch a single design or design learning process during my fieldwork in Kaktovik, because nobody, as far as I know, actually made any skin atigi during the periods I was there—three months in the winter of 1997 and three months in the summer of 1998.

Figure 1. Anguyak in her skin atigi (outer garment) and her fabric atikluk (inner garment).
© Photo Galleri Galaaen, Røros and Janne Reitan

Figure 2. Copy of old Selbu mitten and New Selbu mitten.

Figure 3. A woman's frock "…from the head of Norton sound". National Museum of Natural History (NMNH 176105) and b. a frock, or atigi, from the Iñupiaq district around Point Barrow (NMNH 74041).

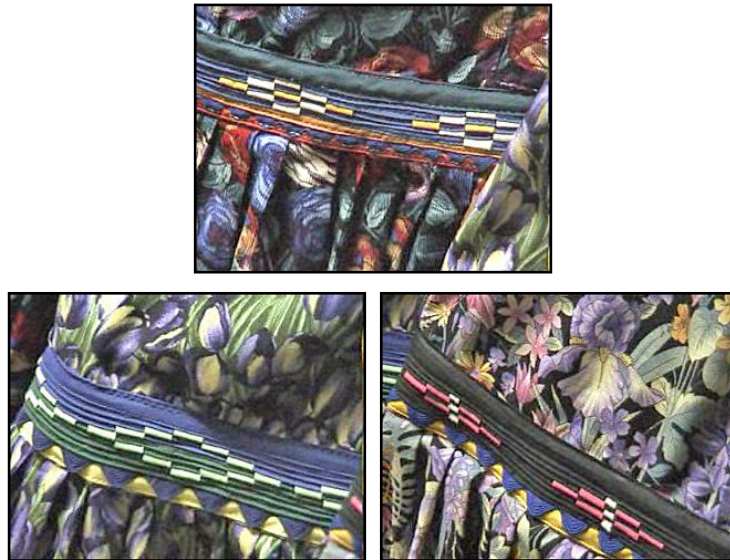**Figure 4.** Female and male Iñupiaq atigis in the village of Kaktovik.

Figure 5. Three different atigit made by one seamstress of Kaktovik.

Learning-by-watching

The present investigation of Iñupiaq clothing design indicates that *learning-by-watching* was the most common method of learning. This concept of learning-by-watching can be seen as a development of both Schön and Wenger's theories of learning, a concept that will probably be of great importance in further research on the design learning process in both primary and secondary schools, in addition to academic design schools.

As well as being a design situation, this was a *learning* situation, in particular for the children. They *watched* what the seamstresses did—learning-by-watching—and listened to their comments in the dialogue of the design situation.

Learning-by-watching reflective practitioners

It is difficult to explicitly articulate the rules involved in designing; on the other hand, it is much easier to describe deviations from the norm. Schön also links reflection-in-action to John Dewey's concept of *learning-by-doing*, as an argument for the idea that "…we can think about doing something while doing it" (Schön 1983, 54).

Schön considers the term *practice* to be ambiguous. Practice refers to "performance in a range of professional situations" (Schön 1983, 60)—for example, what a lawyer does—or as "preparation for performance" (Schön 1983, p. 60)—for example, the repetitive or experimental activity of a piano player. A professional practitioner does both, Schön says; "he is able to 'practice' his practice" (Schön 1983, p. 60). Through this, the practitioner develops "a repertoire of expectations, images, and techniques" (Schön 1983, p. 60). From this repertoire, the designer can compose new variations (Schön 1983, p. 140). Schön, a jazz musician himself (Waks 2001), states that improvisation—"varying, combining, and recombining a set of figures within the schema" (Schön 1983, p. 55)—is a typical example of reflection-in-action. The schema is known to all the musicians, and each of them has an individual repertoire to pick from when improvising. To make this even clearer, he also mentions verbal conversation as a kind of collective improvisation (Schön 1987, p. 30).

One key concept that emerges from Schön's theory of design practice is *dialogue*. In his most quoted book, *The Reflective Practitioner,* he talks about "Design as a Reflective Conversation with the Situation" (Schön 1983, p. 76). In his books, both from 1983 and 1987, he uses the term *conversation*, which I perceive to be synonymous with his sense of dialogue. Schön confirms this conversational interpretation in an article, although the term he used was dialogue. "In a designer's dialogue with a situation, types can function both to transform the situation and to be transformed by it" (Schön 1988, p. 183). Dialogue is employed here in a broad sense, referring to the designer's connection to the *materials* of the design situation and the *body of design principles* s/he carries with him/her, principles acquired either from experience or training and that may be either consciously or unconsciously held. The term conversation, if utilised here according to Schön's sense of it, could lead to the misunderstanding that the connection between the designer and the materials of the situation is exclusively *verbal*—that is, oral—as a kind of mystical or supernatural connection. Dialogue, on the other hand, is usually applied in a broader and often more metaphorical context, denoting a meaningful, but not necessarily verbally expressed, exchange between a person and something else—in this instance, the material of the design situation, into which the socially constructed aesthetic values of the local community also impinge.

This corresponds to Schön's interpretation of conversation in a metaphorical sense (1983; 1987).

However, I think Schön fails to see the learning-by-watching in the learning situation between the student 'Petra' and the architect teacher 'Quist'. His emphasis on the auditory sense, which was in play in the coaching activity, perhaps arose from his own experience as a jazz musician, and in the same manner, his inability to see the importance of the visual sense in learning-by-watching might be due to his lack of experience in the visual arts and design. To me, with an inside knowledge of all that is visual in design, the learning-by-watching was obvious. In Kaktovik, where most of the learning and practice of Iñupiaq clothing design was tacit, the visual learning was conspicuous. The practitioners learned by observing the designing, including reflection-in-action or reflection-on-action—reflections that were tacit or articulated verbally. The numerous examples of reflection in and on action in the empirical material indicate that the vernacular designing of Iñupiaq clothing is a conscious process despite the limited degree to which it is articulated in words.

Schön's theory of the reflective practitioner does not seem to have been exposed to extensive critique. Those who do not agree with him have perhaps chosen to neglect rather than critique his ideas. However, parts of his theory have been criticised by some of his adherents, in particular within teacher education. One of them, Newman (1999), has reinterpreted Schön's epistemology of reflective practice through Wittgenstein's later work (Wittgenstein 2001), and in particular the concept of *language games*, in the context of teacher education. Newman states that Schön's theory lacks the essential requirements of a new epistemology, something that Schön ought to take into account because he describes his theory in epistemological terms: "a theory of meaning and an account of language" (Newman 1999, p. 183). Schön claims to build on Wittgenstein's work, but Newman asserts that Schön did not extend Wittgenstein's theory. Newman sees Schön's notion of reflection-in-action as redundant. Rather than supporting Schön's theory, Newman's reinterpretations of Schön's empirical investigations show that these case studies actually support the view of Wittgenstein in his later work, as meaning in language is determined by use and rules depend on the social—that is, the taken-for-granted—practices or customs of society. Newman is perhaps right in suggesting that Schön has fallen short of his ambition to create a new epistemology of practice, but for the present investigation his ideas remain highly interesting, especially with regard to reflection-in-action.

I do not see *learning-by-watching* as contradicting Schön's highlighting of coaching. My contribution is to extend the concepts of practice and learning within the theory of the reflective practitioner. In addition to coaching, learning as watching is important.

In the interpretations inspired by Schön's theory of reflective practitioners (Schön 1983; 1987), I notice that the *social aspect* of the learning and practice of designing Iñupiaq clothing is underestimated. This is something that I regard as crucial for understanding the learning process in Kaktovik. In the next section, which is devoted to interpretation, I extend the social aspect of the design process for Iñupiaq clothing.

Learning-by-watching in a community of practice

In this section,[§] I focus on the context of interpretation, the community of practice (Lave and Wenger 1991; Wenger 1998), which I think is particularly relevant to an

---

§. An abridged version of this section is published in (Reitan 2006).

enquiry into vernacular design practices and design learning because this social learning theory fits the social practice of vernacular design, although the approach of Lave and Wenger deals with a general theory of learning and not design learning. How do the women of Kaktovik learn and practice the design of contemporary Iñupiaq clothing as a community of practice?

When I asked the informants about who taught them to sew, I often received no answer at first; only after a while did they come up with an answer. One reason could be that they really did not know how they learned to design and sew because nobody explicitly taught them. Some of them remembered who showed them how to sew skin, but more rarely did they remember who showed them how to sew fabric clothing. Because the learning process was so integrated within everyday life, they were not aware of it themselves.

It seems that learning-by-observation, and in particular learning-by-watching, has been a traditional method of learning among the Iñupiat. Before the school teachers and missionaries came to North Alaska, the children learned through continual observation, mixed with regular instruction and tempered by practical experience (Murdoch 1988 [1892]. The first phase of learning-by-watching of modern-day Iñupiaq clothing seemed to take into consideration the young children's lack of motor skills and their inability to technically manage the sewing of the narrow rows of tapes that are necessary if one is to make a good qupak. What characterised a novice seamstress were rows of tape that were too wide, as was the case with my first sample (Figure 7).

However, young girls often did some skin sewing, such as making yoyos or small seal figures. When I expressed my astonishment that they did not practice on parts before they actually made an entire Iñupiaq garment, one of the informants told me that she had received a sewing machine for children when she was about seven years old. She practiced on this, and she also sewed some Western-style clothing, before she made her first Iñupiaq garment at about the age of sixteen. I did not find out whether this was a common experience.

Figure 6. *My sample of qupak #1.*

.

The first phase of the learning process, before newcomers made their debut as seamstresses of Iñupiaq clothes, was a long one; it stretched from infancy to the teenage years or young adulthood. Throughout these years, the girls and young women would gradually but consistently focus on the different aspects of the processes for between twenty and a hundred different garments, made by various seamstresses. In this phase, they learned only by observation, without practicing or trying to sew fabric Iñupiaq garments. This first phase of learning-by-watching seemed to take into consideration the young children's undeveloped dexterity, as dexterity was needed to sew the narrow rows of tapes to make a good qupak. Although the children did not

practice the making of Iñupiaq clothing, the tradition has not died out. In the second phase of learning, after their debut, adult seamstresses constantly develop their knowledge of how to make Iñupiaq clothes as they continue to take part in the community of practice.


Figure 7. Children learning-by-watching.

Learning-by-watching was also important when they learned to sew skins; that is, in addition to learning-by-doing:

> *Janne*: Did you think sewing was fun when you were a kid?
> *'Victoria'*: Yeah, ever since I started learning I helped my mum to thread her needles. Because we had seal lamp, and I could help her to thread her needles. That's why I helped her; to learn. As soon as I know how, that to do, I start helping and sewing.

This has also been confirmed by statements from other elders, such as Rachael Sakeak, whose Iñupiaq name is Nanginaaq: "When we were growing up, we watched our mothers make clothing, and tried to follow their footsteps" (Edwardsen 1983, p. 24). Learning-by-watching is also important within learning-by-doing—to watch what you are doing yourself, experience what you do and reflect on it:

> 'Lynn': Just from experience, when I got started my work wasn't as even or measured like, I maybe like some work like this. I did start out a little uneven here and there. And also with the gathering that happens when you begin to sew at first. But with time you'll learn that…you'll discipline yourself in *watching* (my emphasis) how much time you spend and trying to making everything more even. After you have sewn awhile you'll get better at piecing things together.
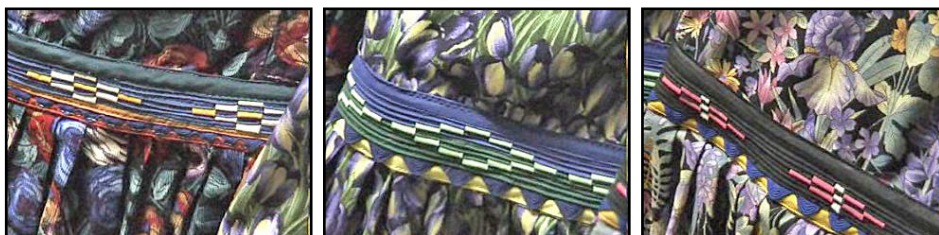
Figur 8. Three different atigis made by 'Joanna'.

'Joanna', who was a skilled seamstress, also learned by watching. The sample or pattern for her work was a sample made by one of her very skilled sisters (Figure 9).

She did not copy the pattern, but used it as an example of good composition for the trim work. She changed the composition and shape of the trim very little. She actually made two different atigis simultaneously, using the same sample as her inspiration (Figure 8). The different garments show variations in the shape, though they do not vary greatly. However, the colours of the compositions are very different because they are adapted to the colours of the fabric for each atigi, according to the traditional rules of contrasting and matching. 'Joanna' followed the rules of composition by not deviating much from her sister's sample. By making a composition of colours by adjusting them according to the fabric, she improvised within the traditional framework.

The fabric of the atigi cover 'Joanna' was making was of a floral pattern in green, blue and some yellow hues (Figure 9). I watched 'Joanna' picking up a *dark green* bias tape and putting it on the fabric to see how it looked, and then putting it back again, talking to herself. Then she picked up another *lighter green*, looking at it on the fabric and putting this one back, too. After a while 'Joanna' found a third bias tape, maybe the same colour as the last one, but narrower, putting it together with the *yellow* bias tape she already has sewn on, and finally putting that one back, too. It seemed as though she was looking for something special, maybe a colour she could not find. Her visiting baby grandson was screaming in the background. All the family was present, talking and laughing. She found some dark blue rickrack. "Let me see, which…?" 'Joanna' said, picking a darker yellow bias tape. Then she picked a dark blue bias tape and tested it relation to the fabric, and the yellow bias tape she had already chosen, and a dark green bias tape again, like the first one. Finally, 'Joanna' chose the dark blue rickrack and the dark green bias tape.

This shows that the learning process is, to a considerable extent, a result of close observation; in other words, a result of learning-by-watching and not of teaching.

I see learning-by-watching as a broadening of Wenger's learning theory about communities of practice. Wenger has not mentioned how the members of a community-of-practice actually learn. I regard learning-by-watching as a crucial method of learning within a community of practice, in particular within the visual field of design. In a more auditory field such as music, I would regard learning-by-listening as the most crucial. Both watching and listening can be gathered within a generic term I will call observation—learning-by-observation.

I have tried to extend the community-of-practice theory by investigating the social process of learning; this is learning-by-watching, a highly visual process in the design of Iñupiaq clothing. In a broader sense, I see learning-by-watching as the visual aspect of learning-by-observation within a community of practice. However, I do not see learning-by-observation as the only 'mechanism' of learning (Lave 1997), but rather as an important but underestimated part.

Because the learning process was integrated within the community of Iñupiaq seamstresses, it was continuous and had no beginning or end. The first phase took place before the newcomers made their debuts as seamstresses of Iñupiaq clothes. The first phase of learning started in infancy, when for the first time the prospective seamstresses were able to recognise what was going on around them, by watching and listening. This was true for each individual who grew up in the community. They had access to the community of practice as legitimate peripheral participants just by being at home and absorbing the everyday life of their families. This first phase ended when, as young women, they made their debut as participating seamstresses, usually in their late teenage years or as young adults starting their own families. The older
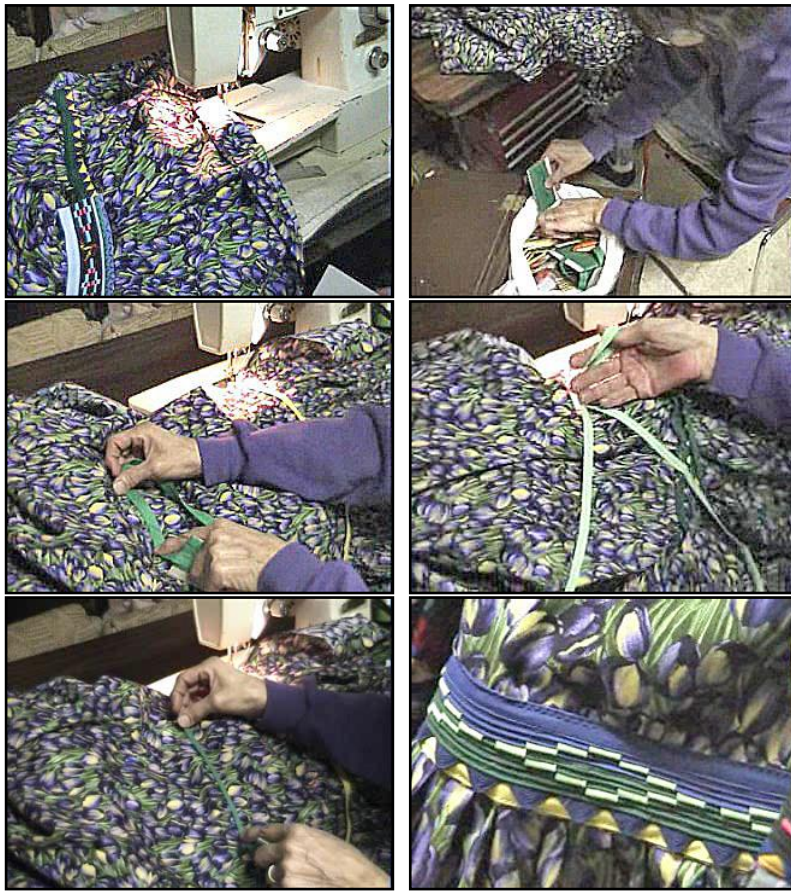
Figure 9 Reflection-in-action when designing qupak

seamstresses often made Iñupiaq clothing for many of their extended family, and even for friends, but usually the young wives and mothers made Iñupiaq clothing for their own husbands and children. This first phase was a long learning period of about twenty years, where the girls gradually but consistently focused on the different aspects of the processes involved in designing and making many different garments, observing how they were done by various seamstresses. However, in this phase, they learned only through observation, without attempting to sew fabric Iñupiaq garments. This first phase of learning-by-watching seemed to take into consideration the young children's lack of motor skills and their inability to technically manage the sewing of the narrow rows of tapes that are important components of a good qupak. Although the children did not practice making Iñupiaq clothing, the seamstresses did not think the tradition was dying out.

The knowledge was demonstrated through practice—and not out of context. Usually, the designing and making of Iñupiaq clothing was, to a large extent, the result of tacit knowledge expressed through practice rather than through words. This was particularly true with regard to design, as it was different from technical matters, which seemed easier to verbalise. However, the theory about matching and contrasting was expressed verbally by several of the informants, independent of each other. This indicates that the designers are, at least partly, verbally conscious of the conditions in

play when they are composing the design of, for instance, a qupak. Often, the same person, the Iñupiaq seamstress, is both the designer and the maker, and sometimes even the user, of the garment in question, and so she seldom needs to explicitly verbalise questions about the annuġaaq's design. Since the learning happens non-verbally—in particular through learning-by-watching—the community of practice for the design of Iñupiaq clothing recognised no great need to verbalise this knowledge.

Schön and Wenger versus Dewey

Schön and Wenger's joint focus on learning-in-practice was explicitly inspired by Dewey's concept of learning-by-doing. Both of them refer to Dewey (Schön 1983, 1997; Lave and Wenger 1991; Wenger 1998). The present investigation of Iñupiaq clothing design indicates that learning-by-watching, rather than doing, was the most common way of learning. I see this concept of learning-by-watching as a development of both Schön and Wenger's theories of learning. I think that Schön's theory of how to educate reflective practitioners misses the crucial aspect of visual learning, which is particularly important in the field of visual design, such as for architecture and industrial design. Nor does Wenger mention the visual aspect of learning. He stresses that learning is conducted in the community of practice, but does not indicate how the learning actually takes place. The focus here is on how the learner learns—and not how the teacher teaches. The latter is often the major focus in learning theories.

Learning-by-watching is actually a new term related to an old phenomenon, a parallel to Wenger and Lave's (1991) communities of practice: "Although the term may be new, the experience is not" (Wenger 1998, p. 7). As explorers and missionaries reported, watching their elders was a common Iñupiaq way of learning, as observed in the late 1800s. This indicates that watching was a common learning method in their traditional society before Euro-American teachers came to North Alaska. My intention is to extend the meaning of learning-by-doing to include learning-by-watching, not to deny the importance of doing. As a matter of fact, Dewey himself criticised the misuse of the concept of learning-by-doing whenever he saw it being reduced merely to activity (Dewey 1979 [1915], p. 255). He includes reading in doing, although he does not mention watching processes and products as part of the learning-by-doing concept, as far as I know. I regard learning-by-watching as a crucial way of learning within a community of reflective practitioners, in particular within the visual field of design. In the more auditory field of music, I would regard learning-by-listening as the most crucial feature. Both watching and listening can be highly important aspects of learning-by-doing. I would encompass them both within the generic term observation—learning-by-observation.

Learning-by-watching at schools, from Kindergarten to PhD programs

What traditionally has been regarded as learning (Kvale 2003, p. 9) is a student or students listening to a teacher who is verbally explaining a phenomenon (speaking to the whole class or to a single student), supplemented perhaps by the teacher writing on a board or drawing a sketch or map. These activities are all intended to have a pedagogical purpose; they are not considered as activities for their own sake. From my experiences, these activities were rare for teachers in arts and crafts education in

Forming, Norway, from 1960 to 1997; this education included drawing, textiles and woodwork (Nielsen 2000). In Forming, learning-by-doing was often the ideal, and the misunderstanding of the concept went even further, in my opinion, often just meaning *doing,* with the *learning* left behind. In the lessons in Forming, the students should have been encouraged to express their inner feelings, not learn anything. There was nothing to learn, even by doing; the students just needed opportunities to express themselves. One result of this doctrine has been that the teachers never demonstrated or instructed, and the students rarely watched any samples, models, or patterns, nor any artefacts or processes. The importance of learning-by-watching—in this mainly visual subject—has indeed been overlooked.

Perhaps further research will show that learning-by-watching is a more important part of professional design learning than the design educators are aware of today. If it transpired that such an idea were shown to be valid, this would probably lead to pressure for change in the way design is taught in design schools. One suggestion might be to introduce the students to actual design work, in the real world of design practice at professional design firms, as a way to participate in the community of design practice. Perhaps this should become a regular part of the curriculum. The main purpose would not be the students' contribution to the work of the design firm, but rather how the students would benefit from observing—with their eyes and their minds—the more experienced designers in the firm. Gradually, the students could also learn by doing, of course, but learning would be the main purpose of this practice. To make this possible, the professional design firms should be paid to accept students for learning, as this is the common practice in teacher training, at least in Norway. This kind of practice would also contribute to solving the kind of problems that Lawson indicates arise in design education that is focused entirely in studios at the college or university, where they lack the challenge of "clients with real problems, doubts, budgets and time constraints" (Lawson 2006, p. 7).

Another suggestion would be to make a virtual paradigm for learning-by-watching, using video films of real design processes, conducted by professional designers, to help teach the design students. This would make it possible to watch a process, or particular parts of a process, over and over again, providing an instant version of the long-learning process of the children of Kaktovik, like when I was learning for research-by-design in this project.

A few of the better-educated design students in compulsory schools would certainly become better novice students in design schools, which would probably improve their quality as up-and-coming professional designers. Consequently, to improve design education in both compulsory and academic design education, the use of learning-by-watching in communities of practice would help create reflective practitioners and better designs in the long run.

I regard learning-by-watching as one aspect of learning-by-doing, which can be understood as learning in practice. Another important research theme would be to more deeply explore Dewey's theory of learning-by-doing —a concept that is interpreted in different ways in different contexts—with an emphasis on design learning. I regard the concept of *tacit knowledge* as being important to this connection. Since the 1980s, there has been a great development of theory connected to this concept—or 'knowledge in action' (Molander 1993)—not least in the Scandinavian countries (e.g. Johannessen, Danbolt and Nordenstam 1979; Johannessen and Rolf 1989; Göranzon and Florin 1991; Molander 1993). The concept has been contradictorily interpreted and discussed in different research studies within different professions, not

least in nursing (Josefson 1991). There is also an interesting discussion going on about tacit knowledge and visualisation (Gamble 2004; Daly 2009). To explore these research projects and discuss the consequences in regard to design learning would be of great value in developing the field, both in terms of research and practice.

My ambition in the present research project has never been to build a grand theory. Rather, I hope these interpretations of vernacular Iñupiaq clothing design, inspired by Schön's theory of the reflective practitioner and Wenger's theory on communities of practice, can contribute to an adaptive theory about the practice and learning of vernacular design—with the focus on learning-by-watching in a reflective community of practice—in order to develop a better understanding of how design is learned and practiced in general – *Design thinking* (Cross 2011). To fill the present, and rather vast, holes in this patchwork of design research, I have here suggested some research 'patches', some stitch work, that I regard as particularly important for strengthening and developing the fabric of design learning in the future.

The neglect of learning-by-watching, as engaged in by the participants of communities of practice in art and design education, constitutes a shortcoming in both design and art education, which therefore, over time, represents a shortcoming for art and design practice. When the learners do not build on the experience and knowledge of master craftspeople, the result will often be poorer quality. This could be improved if the learners go to a community of design practice and learn-by-watching. I believe this is comparable to the research custom of building on previous research. Here, art and design education has something to learn from research. It is difficult to imagine interesting research results if the researcher does not build on previous experiences and theories. If the researcher does not create new knowledge in the field, the research is merely an uninteresting exercise on the reinvention of the wheel. In the same manner, focusing on previous experiences and a collective repertoire through learning-by-watching (both processes and products) and learning-by-observation is of vital importance for the improvement of both design education and design practice. With better design education, future designers will improve design quality. Such an improvement in design education in compulsory schools would probably also help train better receivers and users of the designs made by the improved designers. There is room for schooling to educate clients and customers, qualifying them to communicate with the designers and demand better designs. A better design education in compulsory school would also make it easier for ordinary people to compose their own designs—as vernacular designers—and allow them to make things, providing an avenue for creative expression. This kind of design is located between the tradition of copying—for example, in folk costumes, which allow for little, if any, creativity in the form of improvisation—and the ideal of so-called 'free-expression', with improvisation within tradition.

References

Alexander, Christopher. 1964. *Notes on the Synthesis of Form*. Cambridge, MA: Harvard University Press.

Cross, Nigel. 2011. *Design thinking: understanding how designers think and work*. Oxford: Berg.

Daly, Richard H. 2009. "Communicating the Nonverbal Knowledge of Working Life. Making visible the invisible." In *Knowing Work: The Social Relations of Working and Knowing to Work*, edited by Liv Mjelde, 97-124. Bern: Peter Lang Press.

Dewey, John. 1979 [1915]. "Schools of Tomorrow." In *John Dewey: The Middle Works, 1899-1924*, edited by J. A. Boydston. Carbondale, IL: South Illinois University Press.

Edwardsen, Dorothy Panikpak, ed. 1983. *Uqaluktuat 1980, Elders' Conference, Womens Session*. Barrow, AK: North Slope Borough, Commission on Inupiat History, Language and Culture.

Gamble, Jeanne. 2004. "Tacit Knowledge in Craft Pedagogy: A Sociological Analysis." PhD diss., School of Education, University of Cape Town, Cape Town.

Göranzon, Bo, and Magnus Florin, eds. 1991. *Dialogue and Technology: Art and Knowledge*. London: Springer-Verlag.

Johannessen, Kjell S., Gunnar Danbolt, and Tore Nordenstam. 1979. *Den estetiske praksis* (The esthetical practise). Bergen: Universitetsforlaget.

Johannessen, Kjell S., and Bertil Rolf. 1989. *Om tyst kunnskap* (About tacit knowledge). Uppsala: Uppsala universitet.

Josefson, Ingela. 1991. *Kunskapens former: Det reflekterade yrkeskunnandet* (The forms of knowledge: The reflective knowing of skills). Stockholm: Carlssons.

Kvale, Steinar. 2003. Forord til den danske udgave (Foreword to the Danish edition). In *Situert læring og andre tekster*, (Situated knowledge and other texts) edited by Jean Lave and Etienne Wenger. København: Hans Reitzels Forlag.

Lave, Jean, and Etienne Wenger. 1991. *Situated Learning. Legitimate Peripheral Participation*, *Learning in Doing: Social, Cognitive, and Computational Perspectives*. Cambridge: Cambridge University Press.

Murdoch, John. 1988 [1892]. *Ethnological Results of the Point Barrow Expedition*. Washington, D.C.: Smithsonian Institution Press.

Newman, Stephen. 1999. *Philosophy and Teacher Education. A Reinterpretation of Donald A. Schön's Epistemology of Reflective Practice*. Aldershot: Ashgate.

Nielsen, Liv Merete. 2000. *Drawing and spatial representations: reflections on purposes for art education in the compulsory school*, Oslo School of Architecture, [Oslo].

Kuhn, Thomas S. 1970. *The Structure of Scientific Revolutions*. 2nd ed. Chicago: University of Chicago Press.

Lawson, Bryan. 2006. *How Designers Think: The Design Process Demystified*. 4th ed. Oxford: Architectural Press.

Polanyi, Michael. 1983 [1966]. *The Tacit Dimension*. Glouchester, MA: Peter Smith.

Reitan, Janne. 1992. "Selbustrikking - kompetanse for morgendagen?" (Traditional Norwegian Knitting – knowledge for tomorrow) Hovedoppgave i forming (Master thesis), Statens lærerhøgskole i forming Oslo (Oslo Art and Design Education University College), Oslo.

Reitan, Janne Beate. 2006. Inuit Vernacular Design as a Community of Practice for Learning. *CoDesign* 2 (2):71-80.

Reitan, Janne Beate. 2007. Improvisation in tradition: a study of contemporary vernacular clothing design practiced by Iñupiaq women of Kaktovik, North Alaska, Oslo School of Architecture and Design, [Oslo].

Simon, Herbert A. 1982 [1970]. *The Sciences of the Artificial*. 2 ed. Cambridge, MA: MIT Press.

Schön, Donald A. 1983. *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books.

Schön, Donald A. 1987. *Educating the Reflective Practitioner. Toward a New Design for Teaching and Learning in the Professions*. San Francisco: Jossey-Bass.

Schön, Donald A. 1988. Designing. Rules, Types and Worlds. *Design Studies* 9 (3):181-190.

Waks, Leonard J. 2001. "Donald Schon's Philosophy of Design and Design Education." *International Journal of Technology and Design Education* 11:37-51.

Wenger, Etienne. 1998. *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press.

Wittgenstein, Ludwig. 2001. *Philosophische Untersuchungen: The German Text, with a Revised English Translation*. Translated by G. E. M. Anscombe. 3rd ed. Oxford: Blackwell.