Abstract

What impact does the physical act of drawing have on thought processes? How may the knowledge through Drawing be reflected and lead to epistemic insights?

Drawing is a classical art and design practice that is in recent times both methodologically and theoretically rediscovered. The return is accompanied by a redefinition of what may be drawing in the digital age. What role do the latest technological developments of drawing tools play and how can they be used in practice-based research to achieve knowledge?

This paper addresses these theoretical and methodological questions on the basis of specific drawing experiments – and therefore the experimental use of drawings as a reflective tool in thinking and design processes. The resulting drawings are of secondary importance, focussing rather on the meta-level of the artistic practice. It is an investigation about how knowledge is gained by drawing and how this process can be methodically, theoretically and practically be reflected.

KEYWORDS: Drawing, Implicit Knowledge, aisthesis, Picure Act, Body, Acting, Perception, Process, Analog, Digital, Hybrid, Tools, Skill, Training, Handling, Experience

Introduction

My theoretical and practical study of the act of drawing is based on a long practice and involves the question as to how knowledge arises in the medium of drawings. My long-standing interest in drawing has to do with the fact that I consider drawing more as part of my design approach than as a demonstration of skill. And so I will consider drawing here not merely in terms of artistic procedures and design skills, but most of all as a way of thinking that generates knowledge during the very execution of images. Coming from a design background, that is not only but mainly graphic design and visual communication, I will refer in this paper to processes, examples and techniques in that field. Taking into account recent developments of digital and interactive technologies, I examine the importance of tools and their use. The act of drawing and the actions involved are illuminated by means of drawings experiments and theoretical reflection. With this paper I do not present final results but open up the ground of drawing research and knowledge in the making from a design as research perspective: A loosely woven fabric with open ends.
Fig.1: Model of the Drawing Process: Eye, Hand and Sketch are connected through a acting and reacting network

To avoid confusion in this paper with the word drawing as both noun and verb, I will use drawing for the activity and sketch for the result. The growing interest in drawing is closely related to the change in emphasis across all disciplines from goal-oriented to process-oriented procedures. The sketch has been assigned a special role, because it has always been used in these operations and remains still an expedient tool for the visualization and communication of ideas. This development implies two basic questions: how is knowledge produced by the act of drawing? And how is knowledge actively transmitted by sketches? Both questions emphasize doing and action, and so the relationship between manual activity and thought processes.

The model shows the drawing process and as a network of different agencies of the body. Assumptions I get from theories are used in order to develop drawing experiments, to raise questions, visualize them and sharpen an unclear thought. The theories which I use as ‘raw material’ to create a network of reflection mainly include the following: First, the developments in the field of aesthetics, meaning ‘Aisthesis’ or ‘sensuous knowledge’; secondly, Michael Polanyi’s theory of tacit knowledge; and thirdly, the Picture Act Theory by Bredekamp. All three theories are concerned with the involvement of the senses, especially the visual and haptic perception in communication processes. Already Plato described in his cave and line parables, the visualization of body movements and gestural acts as a form of knowledge (Bredekamp, 2012, p. 40–42). But Plato considered it not equivalent to the knowledge of the intellect. A strict definition of rational knowledge as opposed to the sensory impression persisted until the eighteenth century, when Kant linked the two opposites with his statement, ‘Thoughts without content are empty, images without concepts are blind’ (Kant, 1781). Baumgarten established the concept of ‘Aesthetica’ used today as aesthetics in the sense of beauty. Its original meaning involves a much broader notion of
perception of impressions and sensations. Within the theory of aesthetics still exists a
distinction between aesthetic (in the sense of beauty) and aisthesis (in the sense of
epistemology). This leads to a new definition of the traditional understanding of rationality,
the so-called aesthetic rationality or ‘aesthetic aesthetics’ (Bernhard, 2003, p. 31).

Bredekamp refers in his Picture-Act-Theory to today’s prevailing definitions within the
aesthetics (Bredekamp, 2010). He developed a theory that includes the image as a separate
agency in the perception process. The Picture-Act-Theory is derived from the speech act
theory. The latter suggests that while the act of speaking even an act of hearing and an act of
understanding is taking place. In Picture-Act-Theory the act of speaking is replaced by the
image itself as an independent acting entity. The implication of this statement is that the
traditional opposites, passive and active, subject and object, receiver and recipient are
resolved (Bredekamp, 2010, p 49–51).

Michael Polanyi on the other hand focuses in his theory of ‘Implicit/Tacit knowledge’
(Polanyi, 1962, 1964) on the function of gestures in communication processes as a form of
knowledge. He stressed the difficulty of reflection on physical action and and the (in)ability
of the verbalization of manual tasks, therefore designated as tacit and implicit knowledge.
The three theories of sensuous perception as aesthetic aesthetics, the activity of images after
their formation in the Picture-Act-Theory and the tacit knowledge of the body leads to the
division of this lecture. Each section examines the interactions and functions of body actions
with a focus on reflection (eye), drawing (hand) and acting (drawing).

Reflect – The Active Eye

The function of the eye in perceptual processes, such as the act of drawing, is usually
perceived as passive. During the act of drawing a special relationship exists between hand
and eye and the two institutions are actively involved in the creation of sketches. The activity
of the eye serves as an instrument or tool. It is an active recipient of information that is both
intellectually and manually translated.

In this translation process the eye conducts the hand to the act of drawing. For a
comprehensible translation, from seeing to drawing, what is seen is reduced to essentials.
Observation while drawing is never a passive, but always an active process. What is seen, is
taken to be true, even if it is not the objective truth. The direct line of sight produces the
designs of our world, reflecting the not-yet-existing. To record this not-yet-existing, and to
adjust the perception and sharpen one’s observation – this is a drawing approach, which
includes the activity of the eye as a reflective tool. How independent from the hand can the
visual perception unfold in a sketch?

Drawing Experiment 1: SHADOWS/SUNDIAL

Shadows/Sundial is a series of sketches that involves the eye as an active muscle – acting,
reacting and reflecting the visual sensation during the drawing process. In the series of
drawings of a silhouette I have experienced the variation of a single form over a day, by time
and movement through drawing. The approach was methodical: an hour a drawing on A3
paper with graphite.
The intensive observation of a shape varied by the sun becomes an elementary training of perception. My action is slowed down while I'm absolutely physically and mentally focused. Observation while drawing is perception at a glacial pace. The participant observation of shadows, formally transforming over time, is the slow-motion equivalent of a computer-based morphing process. Objects that appear immutable (that object here is my own body) change and move during the observation period.

An important type of perception while drawing is the ability to observe. The senses are addressed with full attention on the drawing object. The observation implies a pause and asks to focus on what is going on inside or outside of one's own bodily sensation. All the senses are involved in this concentration: smell, taste, hearing, touch and especially the sense of sight is required. Kimon Nicolaïdes has named it as follows:

"Although you use your eyes, you do not close up the other senses – rather the reverse, because all the senses have a part in the sort of observation you are to make." (Nicolaïdes, 1941, p. 5)

For enhanced vision all senses emerge and take on the situation. Then they withdraw in favour of the sense of sight. The senses are providing the base for the observed seeing and help to internalize the image holistically – before the actual formation of the drawing. Already, this process is different from everyday perception. By getting involved with this condition one chooses consciously induced isolation from the environment for focused attention on one thing. During the act of drawing itself, the thoughts are only concerned with the next line and its placement on the surface. The object to be drawn appears as if it is seen for the first time. Through repetition and variations, the shape of the object is practiced, grasped as such and gradually recognized formally.
The ancient history of Butades of Sicyon, as transferred by Pliny the Elder, is stated as origin of drawing (Rosand, 2002, p. 4). The daughter of the potter Butades wishes goodbye to her lover, who should go to war. To remember his image, she draws the outline of his head, casted as a shadow by the sun. According to this outline, her father produces a clay relief with the image of the absent lover.

This act of drawing is meaningful on several levels. The moment of creation testifies an immediate action and a direct expression. First, it is perception, then the act itself, and finally the implementation of an idea into a visual representation, which is valid for the drawing process and method I am referring to. I will reflect on the legend of Butades by taking the father’s place. Instead of making a model of my shadow sketches, I translate the manufacturing process into a contemporary concept of design as research. The concept of originality is about to lose its validity, since the activity of the eye is considered to be serial. The shadow sketches show not the original image. They are to be read as materialized metaphor for a process of seeing, enabling access to the act of drawing through visual observation. In the act of drawing the eye functions as an instrument and the body is the apparatus of perception. The resulting sketches negotiate the formal differences arising from this process. They serve as the materialized model of intangible shadows. The shadow drawings assist reflection on visual perception and their materialization in the act of drawing.

The idea of the shadow experiment is found in the design in the concept of Generative Design. In the 60s, the Swiss designer Karl Gerstner (Gerstner, 1963) influenced a method for generative design, which was based on principles of constants and variation. Today, the term primarily arises in connection with digital design programs. Logarithms and random principles generate new forms and objects from an existing matrix.

But in Gerstner’s analog principle the precondition is an experimental system where, through small changes in the process sequence, several variations are generated. The silhouette of Butades can be converted in a programmatic discussion on Generative Design: The body
casts a shadow due to light exposure. This shadow is imaged on a surface as shape. Every movement of the body and subtle changes of the light source influence the perception of the shape.

For the shadow sketches I introduce instead of digital-generative design the concept of analog-generative design. Thus, any minimal change in the object and the body is caused by perception and observation. The body is the instrument of the analog-generative program. It runs constantly in loops and creates variations of the same shape by repetition. The insights of this act of drawing are included in the variations. They would have been remained invisible without the constant repetition of the generative drawing program.

Redraw – The Drawing Hand

A sketch can be defined as follows: A gesture of the hand, which manifests itself as a trace on a surface. As a sketch this act becomes directly visible. Applied to the theory of Anatomy and Linguistics, as Leroi-Gourhan noted (2008, p. 459), one can say that the immediate sketches are intended as verbal gestures and act as mediators in human communication.

_The gesture in drawing therefore helps to imitate something or refers to missing skills and serves as compensation. This form of gesture is clearly visible in the inscription in the drawing medium._
(Gethmann & Hauser, 2009, p. 343)

This becomes obvious in the gesture of showing, if we point at something or someone with our fingers, hands and arms. These gestures want to touch, what can only be seen. There is an implicit connection between vision and gestural action to fulfill a communicative purpose (Boehm, 2010).

Drawing Experiment 2: FIGURES

In the experiment ‘Figures’, the handiness of tools and the issue of training, experience and skills are examined. Particularly in the application of analog, digital and hybrid media and their smooth transition, the hand literally ‘grasps’ in the drawing process.
Often I have been sketching people in attitudes of waiting. I find myself in the same situation: waiting, posing, weight shifting from one leg to the other, observing and being observed. While sketching my body refers to the bodies of the drawn figures. The figures are observed through my body with eye and hand. For these sketches I apply the technique of so-called ‘blind drawing’ (Nicolaïdes, 1941, p. 9). In the act of blind drawing, the eye exercises no direct control on the hand nor the line on the paper, but only observes in great detail the drawing object. The hand is guided by touch rather than by sight. The external separation of hand and eye requires a close inner connection through the body apparatus, wherein the hand completely trust the inherent body signals. The hand movement is coordinated with the eye movement and the shape of the figure is literally touched on paper.

Experiencing the physical body as an executive apparatus or instrument, allows the drawer to enter on a different level of consciousness. The whole body is both relaxed and tensed, focused on a goal, fully absorbed and concentrated on the manual activity. The body directs the moving hand, but without being conscious of it. Michael Polanyi describes in his article ‘The Tacit Dimension’ (Polanyi, 1962 and 1964) the suspension of language that characterizes this experience. He calls this non-verbal knowledge ‘tacit knowing’, an implicit knowledge that is generated by experience, action, and practice.

T tacit knowing is seen to operate here on an internal action that we are quite incapable of controlling or even feeling in itself ... When we make a thing function as the proximal term of tacit knowing, we incorporate it in our body – or extend our body to include it – so that we can dwell in it ... Our body is the ultimate instrument of all our external knowledge, whether intellectual or practical. (Polanyi, 1964, pp. 14–15)

The resulting analog material of ‘Figures’ prompted me to think about craftsmanship, the use of tools and serial work. Familiar with paper and pen, I decided to stay with the technique, blind drawings of waiting figures, but to change the tool and to draw on a tablet with stylus.
Digital drawing has advantages and disadvantages. The advantages lie in the many possibilities of digital processing. But the many possibilities are not only beneficial, because they carry the sloppy execution in themselves. With the option of backtracking and undoing previous actions, concentrationweakens accordingly. I also see disadvantages in the insufficient bite of the electronic tool on the drawing interface, which makes it almost impossible to draw hard edges and sharp corners. Nevertheless, the transfer of personal expression and style from an analog to a digital medium is possible without loss of quality. Thus, the main components in the act of drawing remain manual dexterity and a trained hand. Tool and surface are simply a matter of habit and handling.

According to Polanyi, processes and procedures rooted in bodily activity are difficult to put into words and thus escape conscious reflection. The attempt to analyze manual activity may lead to an impairment of ability, a loss of intuition and unconscious play. By overcoming this initial loss and willing to make the necessary effort of relearning, deeper levels of knowing will be acquired. Polanyi concluded, however, that the details of these processes ultimately remain inaccessible to scientific analysis (Polanyi, 1964, p. 61).
Nevertheless, something has changed in my act of drawing through the use of digital tools, or more precisely, by the program with which I draw on the iPad. The knowledge of a time-based act of drawing has extended the sketches and resulted in the development of a narrative structure. The waiting situations became situations in which I was waiting to observe the next figure of the animated sketch. The sketches of the digital figures not purely represent the traces of my drawing process, but rather tell the story of my observations.

React – The Acting Sketch

The third part examines the function of the sketch during and after its creation. In the drawing process the sketch plays its own active role. Materialized on a surface, it becomes an independent actant and an important part of the process. This assertion implies that thinking and reflecting upon completion of the act of drawing change and may differ significantly from the reflection and cognitive processes while drawing.

Drawing Experiment 3: JACKET

In another drawing experiment I have observed the variation of a jacket hanging randomly on a chair by sketching its contours on a daily basis over the course of a month. I realized, that the jacket in the picture space was moving and ‘posing’. To illustrate my observation I made an animation from the individual images.
Fig. 7: 'Jacket' – Drawings of a jacket hanging randomly on a chair, over a period of 24 days, from November 11th until December 24th, 2010.

Each frame consists of a sketch, arranged in chronological order. The animation is displayed in a loop but there is no other intentional structure added. The movement can now be seen through the medium of film as enhanced visualization of my thoughts.

But more than that a new agency appeared in the pictures of the animation. It seems as though the jacket and its constantly morphing shape visualizes the unmapped chair. While drawing the jacket, the chair was not intentionally visualised. Yet, its presence is in each sketch and does not vanish in further media containing these sketches. Here it becomes clear that the sketch does not only function as the materialized documentation of the act of drawing. It remains intrinsically active, regardless of the detachment from eye and hand. The sketch thus acts back actively to them beholding eye. It stores a communicable knowledge.
Fig. 8: 'Jacket', Animation, 2011

Space for reflection, redrawing and reacting

Fig: Diagram eye - hand - sketch

In a physical action like drawing, hand and eye are closely linked. I have described this action in detail. Anyone who has experienced this state knows how addictive it can be, because it abolishes the sensation of time and space.

Like an athlete fully concentrated on his actions, the drawer achieves a state of flow, becoming oblivious to the surroundings as continuing to perform the motions of drawing. Upon emerging from this state – which can be experienced at any time or place – it may be very surprising to recognize what has been produced on the surface, seemingly materialized by itself. The drawer resurfaces physically and mentally from this absorption and becomes aware of the resulting actions. The relationship between the body in the act of drawing and the sketch is dissolved, and the view widens to include the overall process of production. Realizing the results of the act of drawing, in which focused attention makes way for a more holistic view, makes for the great potential of the sketch. The processual cycle of drawing as a space for acting and reflecting takes place in the interval between knowing and not-knowing. The act of drawing gives access to a space for thought and action, a space that includes hand, eye and sketch. In these spaces the trace of knowledge by drawing can be found. Communication by means of and about sketches takes place in physical spaces. The various forms of knowledge that appears in such cases – sensuous, implicit, embodied – is complementary to objective and rational knowledge. This knowledge, however, requires a special formal treatment, for each form of knowledge requires a specific form of communication. That I consider as the great task of artistic research on drawing and graphic visualization.

I cannot offer a final conclusion nor final results of my research but another experiment for discussion that hopefully stimulates further thinking on drawing knowledge.
Drawing Experiment 4: TRACKING

Fig. 9: ‘Tracking’ over a period of 36 days, 2012. Program: IOGraph

During ongoing drawing research and graphic experiments, I recorded computer activities with a monitor tracking software. The question posed to me was: What are my hands doing when they leave no traces, when I’m working at the computer? The program visualizes movements of the cursor on the computer monitor. During the ongoing activity the cursor’s movements are tracked and recorded in the background. The program runs independently of various input devices, such as mouse or trackpad. Their operation has no effect on the recorded data and thus are meaningless tools for ‘monitor tracking’. The program is used by programmers and designers to test usability of software developments. Since the screen is separated from devices, the manual movement is translated into a motion on the screen without including the activities and inputs from the keyboard.
Fig. 10: ‘Tracking’, image of repetitive activity, here: image editing with Photoshop

Trackings are mainly conducted by the eye, similar to ‘blind drawings’. They show eye activity executed by the hand and—surprisingly enough—the space the activity was executed within. The spatial dimension can be explained with the graphical overlapping of lines creating an effect of depth. Yet, an evident aspect of the experienced dimensionality arises due to the timely duration. The time issue is essentially linked to the dimensional appearance of the recordings. The recordings thus visualize the two spaces of action and of time.

Fig. 11:'Tracking', image of less structured activities, such as surfing on the internet
The drawings should therefore, rather looked at as translations of manual activity into information graphics. The images illustrate the difference of physical action and their visualization. Are they sketches? The act of drawing as an epistemic process continues.

References