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Visualising ideas: a camera is not enough

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Abstract: *When photography was widely introduced as a tool for documentation, the art of mimetic drawing was challenged as a main activity in art education. This raised the question: Why bother with mimetic drawing in art classes when any object, person or event can be documented with a camera? The question of mimesis in painting and drawing existed long before the introduction of cameras, and it raised philosophical questions in relation to the ideals of pictorial representations. This paper problematises some issues that have constructed a counterproductive contradiction when it comes to training mimetic drawing in general art and design education. This topic relates to stakeholders with agendas for art education, which in some ways is different from the agendas held by stakeholders within design education. The issue of training mimetic drawing in primary and lower secondary education is seen as part of building design literacy as a future competence for all.*

Keywords: visualisation, mimetic drawing, design education, design literacy.

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Background

Some years ago, I participated in a panel discussion on art and design education with other teacher-trainers where I—among other things—advocated the importance of strengthening visual literacy in general education. I argued that visualisation of ideas was a competence for the future and that the training of such skills was integrated into the primary and lower secondary education curriculum in Norway. This argument was based on a notion that decisions will increasingly be made on the basis of pictorial representations. Professional areas, such as medicine and engineering, use visualisation for decision making on a greater scale than ever before; furthermore, in a consumer context, ideas, politics and attitudes are increasingly being communicated visually.

After the session, a Nordic colleague came up to me and held up his compact camera and announced that he could use that piece of equipment to document any situation. He no longer needed the skills of hand drawing to document his experiences. His underlying point seemed to be that drawing is an old-fashioned tool and medium and that it is therefore no longer a skill that needs to be taught in schools. I agreed that indisputable advancements have been made in compact cameras, now also available on most cell phones. The question is, however, whether cameras have made drawing skills obsolete in primary and lower secondary education.

The comment from my colleague indicates that such ideas have some support within the community of Nordic teacher-trainers. Therefore, it is relevant to reflect upon whether or not the increasing use of compact cameras is an argument for a decrease in the teaching of hand drawing or if there are other possible explanations. According to a Norwegian study of drawings by youngsters over a period of five years (1992-1997), their interest in drawing declined from the age of eight to the age of thirteen (Nielsen 2000). This happened despite the fact that these children had art and craft classes in their core education, totally approximately three lessons every week. Cell phones with cameras had not been introduced at the time of the study, so there must be some other explanations.

In this article, I will focus on some repertoires of visual representations and discuss how they are connected to time and to philosophical questions related to how the real world can best be depicted. This issue existed long before cameras were introduced in the 1800s. I will discuss mimetic drawing from the perspective of educational ideas both within the art field and the design field of knowledge. Questions related to how conceptual drawing, which is central in design processes, is connected to the training of mimetic drawing will also be raised. These questions will also be discussed in relation to education for non-designers from the perspective of empowering the public to participate in design processes. Stakeholders from the art world seem to have different views about these questions in comparison to stakeholders representing the design perspective. In order to outline the ideas these different stakeholders build upon, we need to go back in history. I have chosen to discuss different forms of pictorial representations with a focus on questions related to mimesis and linear perspective.

Repertoire in pictorial representations

Today, we have several alternative ways to represent a three dimensional object on a two dimensional surface. Take a bicycle. We know that both a photograph and a mimetic drawing of a bicycle are distortions. They are both two-dimensional representations of a three-dimensional, real bicycle. The bicycle can also be

represented as a projection drawing, with plan and elevation on paper or on a screen. It can also be represented by three-dimensional rapid prototyping in scale or as a 1:1 ratio. Projections and rapid prototyping are tools designers use in the design process to communicate ideas and solutions with their peers, future users, clients or producers. In an art context, the representation of a bicycle can be communicated and interpreted more widely. The artist's feelings about the bicycle can be conveyed by how he/she represents it in his/her work. Here lies the most significant difference between art and design. Art can be a comment or a feeling, while design deals with creating better solutions for our everyday life. The designer can design a better bicycle as a solution for a transportation challenge. There is no doubt that we need both comments and solutions for a better future.

The attitude from my Nordic colleague about drawing being old-fashioned needs to be understood from the perspective of the two fields of art and design. Art and design have a lot in common in terms of visualising ideas and creating artefacts. However, at the same time, they have different aims and values when it comes to ideas for education. Stakeholders from these two fields have different points of departure as a basis for their priorities in an educational setting. These stakeholders have had different influences at different levels in the educational system. In light of this, I have chosen to take a closer look at how mimetic representation has been promoted or inhibited.

Mimetic representations versus projections

The division between depicting what you know versus depicting what you see is well known and has been discussed ever since Plato wrote *The Republic*, where he used representations of a bed as an example. He discussed whether there was any difference in the bed when it was seen from different angles, or whether the bed merely looked different when seen from different viewpoints. He asked: 'Does painting aim at reproducing any actual object as it is, or the appearance of it as it looks? In other words, is it a representation of the truth or of a semblance?' (Plato 1992, pp. 64-65). Plato was opposed to producing paintings that resembled the visible world. If a rectangular table was represented in the way it appeared, the table could be perceived as not being rectangular, because the furthermost edge of the table would seem shorter than the foremost edge. In reality, the edges were of equal length, and a painting should show this equality; otherwise, the painting would be false. According to Plato, a representation of a semblance was false, while a representation of the idea of what an object really was depicted the truth about the object. Plato advocated the principle of true length and angles, which the Egyptians used in their painting style for more than 3,000 years, and he disagreed with the way Greek paintings were developing during his lifetime, which was towards a representation of the visible world (Markussen 1987, pp. 99-100). In contrast to the Greek style, the Egyptians presented a simultaneous frontal representation and a profile representation of the human body in their paintings. The Egyptian *canon* was based on values, wherein the figure was represented from its most distinctive side. It was based upon the principle of representing the world as it was, not as it was perceived. These two canons have widely influenced our Western way of representing objects and space 1) the Egyptian *canon*, which lasted for 3,000 years and 2) the Renaissance *canon*, which lasted from 1425 to 1900 (Markussen 1987, p. 93).

The Renaissance *canon* was based on the principle of representation of the visible world, and the invention of linear perspective overshadowed other ways of

representation in paintings. The concept of representing the visible world as it appears has been understood as a mimetic approach of the visible world, and the laws of perspective from the Renaissance were considered to be the most sophisticated way of rendering such a representation. While the Greeks used foreshortening long before 1450, it wasn't until the Renaissance that foreshortening was given a mathematical explanation, thereby developing the theory of perspective as a tool for representing the visible world.

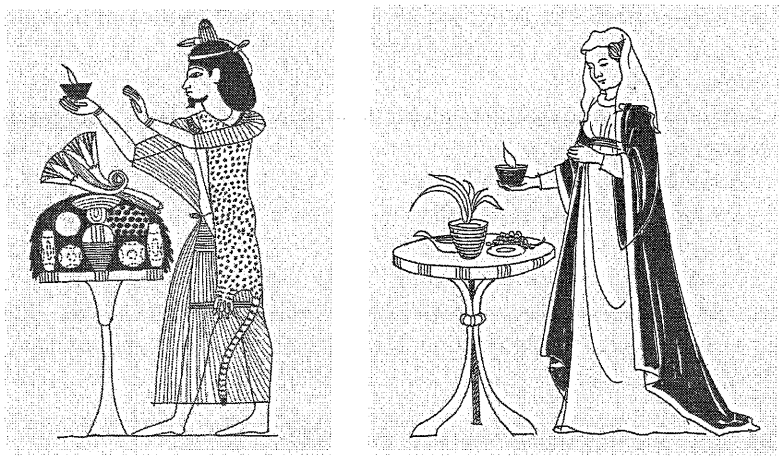

Figure 1. *Reconstructions of the Egyptian canon and the Renaissance canon of representation. In the Egyptian canon, the table filled with food was represented with the simultaneous use of plan and elevation: the table was represented frontally, while the top of the table was represented as an uplifted plan. In the Renaissance canon, the table was represented as a semblance where some objects overlapped others. Source: Laila Eriksen in Farstad et al. 1999, p. 95 and p. 98.*

The mathematical explanation of perspective drawing was significant to both architects and artists in the Renaissance when mimesis was considered important. In Britain, perspective drawing was at its peak in art education from 1860 to 1901 when art and science were still taught in the same department. However, after the final separation of art and science education at the turn of the twentieth century, perspective drawing in education declined, and, according to Stuart MacDonald it was moribund in the 1970s (MacDonald 1970, p. 53). MacDonald has described the rise and fall of perspective in art education in his book, *History and Philosophy of Art Education*, (1970). He emphasises that architectural education has a history that is different from the history of art education. Architectural education has been led by utility, using different concepts of representation, such as isometry and axonometry, in addition to plan, elevation and linear perspective. For the same purpose, axonometric projection was introduced in engineering schools in the late nineteenth century for its usefulness as an accurate technical tool (Pérez-Gómez 1997, p. 314). Axonometric projection contains true length but not true angles, and in a way it merges the two concepts of the visible and the known world.

One universal solution–or anything goes?

In 1927, Erwin Panofsky attacked the notion of linear perspective as a unique, valid method for representing visual reality. One of his main objections was that humans see through two eyes and not one eye, as the linear perspective presupposed (Panofsky

1991, p. 29). Discussions on whether linear perspective can provide a true copy of the visible world have appeared in the art, design and architectural fields, although there are major differences in the discussions concerning accuracy and purpose. The art historian Gombrich has defended perspective, referring to it as: '...the most important trick in the armoury of illusionistic art' (1992, p. 205). For this statement Gombrich was attacked by an American artist, Norman Turner, as late as 1992 (Turner 1992, pp. 139-50). But to claim that perspective is the most important trick of illusionistic art, as Gombrich did, does not mean that it is the *only way*. This searching for *one way* of representation must be seen in the context of a positivistic paradigm, where searching for what can be positive confirmed as universal knowledge is central. Most of us accept the obvious notion that there is *more* than *one* way to represent an idea or an object, and that context and purpose guides the choice of which solution to implement. The artists' revolt against linear perspective encompassed protests against the accepted way of representing the visible world. However, according to Lawrence Wright, the development of cubist paintings was also built upon the perspective tradition (Wright 1983, p. 308). About the same time, European artists developed an interest in children's drawings and in Eastern painting traditions. This interest in children's charming expressions and their mixing of plans has also influenced educational ideas at primary and lower secondary school.

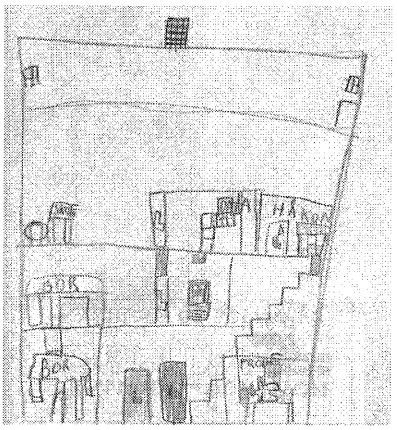

Figure 2. *A seven year old boy has made this drawing of his house. He has used a mix of plan and elevation.*

In the Draw92/97 study (Nielsen 2000), the youngsters struggled to draw a room the way it appeared to them when they were asked to do so at the age of 13. At that age, their interest in drawing had also declined compared to the interest they showed when they were asked to draw at the age of eight. Their struggle indicated that mimetic drawing had not been given priority in their art and crafts classes at primary and lower secondary school. Some of the youngsters had turned to parents, uncles or siblings when they wanted to draw the world as it appeared. This raises the following questions: Is there a conscious ideology behind teachers' choices not to prioritise mimetic drawing? Do teachers have a tendency *not* to teach *any concept* of representation because there is no agreement on one representation being superior to others? Is this a way of declaring anything goes?

Non-teaching promoted by art teachers

In Norway, the structure of Art and crafts in the national curriculum is different than it is in other Nordic countries, which are more like the rest of Europe where art classes are separated from design and craft classes. In 1960, art, textiles and woodwork (sloyd) were merged into *one* subject in Norway—today named *Kunst og håndverk* (Art and crafts) (Nielsen 2008). Now, this Art and crafts subject has four main topics: Visual communication, Design, Art and Architecture (Norwegian National Curriculum 2006). However, even if the Norwegian structure is somewhat special, youngsters in the Norwegian school system seems to have faced the same problems of non-teaching that students in other countries have faced. Angela Anning has described how youngsters are expected to learn visual representation in the art lessons in the UK, while at the same time their teachers neglect teaching them. About the youngsters in school, she says:

> They are expected to learn the Western European conventions of base-line, occlusion, perspective and a single viewpoint – though nobody teaches them how. So by trial and error, rarely via direct instruction, children struggle to master the technical challenges of representing space, scale and perspective. Those who fail to master the technicalities assume from a depressingly early age that they are "no good at drawing" and quickly abandon it as an alternative mode of representation to speech and writing. (Anning 1999, p. 170)

Anning's observations of the youngsters declining interest in drawing correspond with the findings from the Draw92/97 study. The explanation for this seems more and more obvious; the youngsters stop drawing because they are not helped in their struggle to represent what they want to depict. This seems to be a result of the chosen strategy of non-teaching of drawing in art classes. The teachers' choices are probably done on the basis of good intentions, and they are probably seen as a strategy to conserve the children's charming preschool way of drawing expressively using simultaneous plan and elevation. This strategy might have been aimed at maintaining the youngsters' preschool enthusiasm for drawing. However, this has not been the case neither in Anning's example nor in the Draw92/97 study. Youngsters are not comfortable with a preschool drawing style at the age of thirteen, even if their art teacher likes their drawings. This non-teaching strategy is a withholding of knowledge, and it does not promote the joy of mastery, contrary to what some teachers think. Viktor Lowenfeld, who has influenced the philosophy of art-education since the 1950s, was fully aware of the frustration, disappointment and even shock that youngsters could experience at the ages of eleven to thirteen when they became aware of their childish way of drawing. In *Creative and Mental Growth*, he wrote:

> As one of the consequences of this shock the child stops his creative work. He "can't draw anything" because of his sudden critical awareness realises the "inefficient" childish approach. The drawing expression seems "childish" and "ridiculous" because of the sudden awakening of an adult attitude. (Lowenfeld 1957, p. 233)

Working together, Brittain and Lowenfeld developed their romantic concept about art education for youngsters. They are critical of teaching of mimetic drawing to youngsters from the ages of twelve to fourteen. In the fifth edition of *Creative and*

Mental Growth, they state: 'The representation of depth must be discovered by the student. To take this discovery from him by "explaining" perspective would deprive him of an important experience' (Lowenfeld and Brittain 1970, p. 262). Although it appears that Lowenfeld and Brittain regard perspective as unimportant, their questioning of the diminution of trees and the representation of space in the children's drawings indicates that they mean that diminution is important knowledge *if* the child discovers it for himself or herself (Lowenfeld and Brittain 1970, p. 262). This emphasises that the strategy of non-teaching is one of their issues.

Visual representations in education

I am not sure if Turner's attack on Gombrich has furthered the discussion in any meaningful way. However, it shows that some stakeholders within the art world still have problems accepting multiple attitudes about representation of space, in which the linear perspective is just *one* option in a wider repertoire. Technology that serves the computer entertainment industry and pilot simulators, which fascinate youngsters so much, build upon the principles of linear perspective to give an illusion of space. Hence, linear perspective does not seem to have gone out of fashion for youngsters or for the society at large.

If the argument against the teaching of mimetic drawing in school is that it has no relationship to the world the children experience, that argument is too simplistic. Perspective drawing with overlapping and diminution is perhaps the closest cultural conception developed to represent the visible world as it is seen and experienced every day through our eyes. It is also close to the way we see the world in photographs and on television. This does not mean that the images are a copy of the world: all images are distortions, as they are two-dimensional representations. The concept of plans and elevations is more abstract than perspective drawing. The question is whether this abstraction of plans and elevations is preferable to a concept of drawing with overlapping, diminution and, later, linear perspective. It does not benefit the child's development to prefer and protect one conception of representing space over another by hiding the cultural conventions and neglecting to teach the cultural concepts of drawing to the youngsters.

Lowenfeld could not see the consequences of his well-intentioned concept of art education as non-teaching. His concept was obviously a reaction to the existing paradigm of teaching right and wrong in art. In the same way, many teachers today might see their own teaching, or non-teaching, through the lens of self-expression and the 'child art' paradigm (Wilson 2004), which they themselves were taught at teacher training college. The question is whether the strategy of letting children and youngsters discover everything about spatial representation on their own is a strategy that makes them abandon drawing instead of continuing. The romantic ideals of Lowenfeld seems to supports views on art education where there is nothing to teach.

Design promotes a broader repertoire

To jump between the two conceptions of representation—drawing the world the way it is known and drawing the world the way it appears through the eye—does not seem to represent a big problem in the field of design education as it seems to do in the field of art education. Designers and architects use plans and elevations in some drawings and perspective in others because the type of representation is chosen to fit

the intentions of the drawing. The architect's drawings that are intended for the authorities are different from the personal sketches he or she makes at the beginning of a project. The drawings made for the carpenter are different from those produced for the client during the planning process or from the drawings produced for the presentation. Sometimes the drawing explains how space *is* by using plans and elevation; in a different situation, the purpose might very well be to create a drawing of what a room *looks* like.

In reference to the comment from my Nordic colleague, I did not really understand why he was so eager to tell me about his camera, as if he had an insight that I did not have. His argument that the camera is superior to hand drawing would be valid if documentation was the main scope of visualisation in society and in education, but it is not. Visualisation of ideas and solutions not yet articulated by anyone else than the image's creator, requires someone who has the skills to communicate the idea visually.

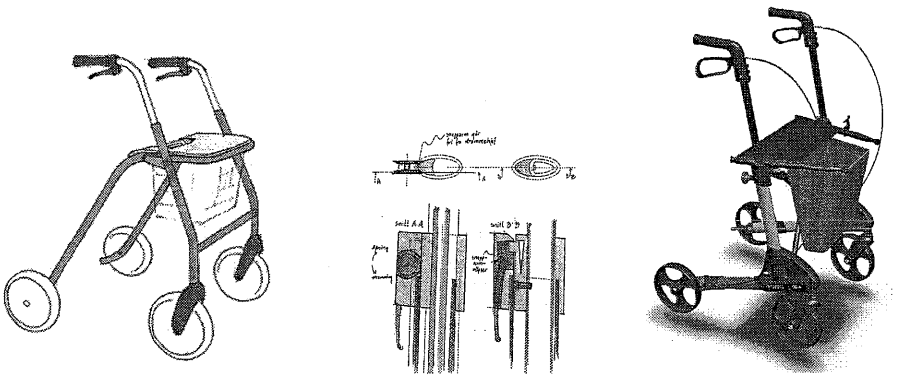

Figure 3. *Sketches by Per Farstad for his walker TROJA produced by TOPRO as. He has used perspective sketches to show the concept, and he has used projections to develop and visualise technical details. Photography is used in the final phase of the design process. This walker received a Norwegian award for 'Good Design' in 2002. Design: Per Farstad.*

It is obvious to designers, architects and engineers to use different repertoire of representations for different purposes. However, this is *not* as obvious to stakeholders within art education. The different viewpoints of stakeholders in art and design would not be a problem if they had equal influence in education at different levels. The Draw92/97 study (Nielsen 2000) indicates that the 'child-art' position, as formulated by Wilson (2004), has influenced education at primary and lower secondary in western countries.

Traditions move slowly in the education system. Educators at the Norwegian teacher-training institutions, with a background in mimetic drawing, have fortunately not yet retired from their positions. Therefore, in teacher-training different philosophies of art and design education exist, side-by-side. Bibbi Omtveit has studied how hand drawing has been taught at teacher-training institutions in Norway (Omtveit 2011). She describes two main positions among the educators: 1) mimetic drawing (observasjonstegning) and 2) conceptual drawing (forestillingstegning). She discusses how the two should not be seen as contradictions, but how the training of mimetic drawing is a *precondition* for clear and significant conceptual drawing. This raises

further educational questions about the lack of emphasis placed on the learning of visual literacy, including mimetic drawing, in primary and lower secondary education compared to the emphasis placed on the learning of verbal literacy. There is no doubt that visual communication is increasingly used to communicate both facts, such as medical visualisation in scans of the human body, and illustrations, such as advertisements.

I see visual literacy as an essential competence for the future. However, the question of how to achieve this competence still remains. Some of the questions raised in this article have to do with different attitudes on what to teach in primary and lower secondary education. Teachers at these educational levels have been influenced both by ideas from the field of art and from the field of craft, and an unnecessary split between the two has been maintained (Brænne 2011). Design education is faced with the challenge of building upon the *best* from the art tradition and the best from the craft tradition to become a central part of the core curriculum in primary and lower secondary education. Both the education of non-designers and professional design education could benefit from a focus on design literacy in primary and lower secondary education where different concepts of visualising ideas are emphasised.

Summing up

It is not yet possible to take a photograph of an idea. A human being is needed to articulate ideas in one way or another. In this article the focus has been on visualising ideas and how visualisation is a point of departure for the communication of design solutions for a democratic and better world. For that purpose, skills in visualising are needed at different levels in education. Some training in mimetic drawing is a precondition for skilful rendering of ideas. Such a statement challenges the romantic philosophies of art education formulated by Lowenfeld and Brittain. Their philosophy of art education has been developed in a context where it was essential to neglect one right solution, such as in positivism. However, instead of allowing *different* concepts of drawing, they fell into a non-teaching ditch. There is no clear support for claiming that this romantic, non-teaching paradigm has advantaged the art and design education of youngsters. On the contrary, instead of continuing to draw, youngsters have stopped, and one of the reasons why, is that they do not feel comfortable with using a child-like drawing style when they are teenagers.

My Nordic colleague is right in this observation that youngsters take a lot of photos, and that is fine. The challenge, not only for those who will become designers but for all people, is how to educate a design-literate population so people will be capable of making good decisions that will create a better future for the world. In this case that means people must be able to visualise ideas in different ways—whether those representations be isometry or axonometry—in addition to plan, elevation, linear perspective and mixed representations. Future decisions will increasingly be made on the basis of visual representations, and this is a challenge for the educational society.

Romantic ideas connected to art still influence the practicing of drawing in primary and lower secondary schools in Norway. This happens despite the fact that the Norwegian national curriculum has a wider perspective with a focus on Visual communication, Design, Art and Architecture. Artistic expression is just one of several ways of visualisation. I think it is time to practice pluralism so as to avoid promoting a narrow art approach in art and design education in the primary and lower school levels. Doing so will benefit good design solutions for tomorrow.

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