

ARTIFICIUM

writings on art
and art education

Visual proficiency

A perspective
on art education



by

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ATHENA

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Preliminary remarks: 24 hours on flickr

Every day, more than a million images are uploaded to flickr – by the end of 2011, over six billion images had already been stored on the image hosting website. An installation created in November 2011 by the Dutch artist Erik Kessels provided a striking visualisation of this flood of images. Kessels printed out all the images uploaded to flickr on one particular day and used them to create an installation, which was so large that it took up several rooms in the FOAM Photography Museum in Amsterdam.



Erik Kessels: 24 Hours of Flickr Photos – Installation – Amsterdam, FOAM – Photography Museum – 2011

In Kessels' installation, the phenomenon of the “flood of images” that emerged with the beginning of the digital age is converted into an analogue format and can thus be experienced both optically and tangibly within a given space. At the same time, the installation demonstrates how confusing, how downright chaotic our present image-dominated world is. However, a generation of adolescents has already been socialised with this flood of images and deals with it on a daily basis, both in their networks and elsewhere.

Art is the only school subject that deals with the problems inherent in images *as images*, making them the focus of pedagogic activity. The situation criticised in Kessels' installation, for example, represents a serious challenge to art education: the present volume attempts to convey both the foundations for engaging proficiently with the phenomenon of the “image” as well as the perspectives for art education that arise from these foundations. It is based upon the conviction that providing orientation in a world defined by images does not mean solely following a constrained technocratic,

functionalist or even neoliberal “concept of education”. Quite the contrary: “providing orientation” for how to deal with images in a world that is dominated by them forms a crucial part of the holistic development of young people’s personalities that education strives to achieve.

The following reflections focus upon a reflexive and receptive engagement with the “image”. However, even though the aspects of production and creation are not the core concern of the educational perspective presented here, they can nevertheless form the foundation of creative work in art classes.

While teaching “visual proficiency” is part of art education’s most important and most complex educational remit, it does not cover its entire potential: visual proficiency is simply *one* aspect of art education.

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Düsseldorf, autumn 2013

K. B. – R. N.

1 Introduction: After the *pictorial turn*

A spectre haunted the industrialised nations around the turn of the millennium, the spectre of *anaesthetics*. It was the fear of the flood of images that had appeared in the wake of postmodernity – and above all, it was the fear that young people would be numbed and anaesthetised through an overdose of “aesthetic” offerings, resulting in their corruption. Odo Marquard first introduced the concept of anaesthetics, which was subsequently taken up and disseminated by Wolfgang Welsch.¹

Twenty years later, however, it can be stated that many of these fears have not come to pass. Rather, a generation has grown up that has been influenced significantly by images and image media, but it has not been *anaesthetised* by the overwhelming “aesthetic” offer. In, with or perhaps even despite the postmodern flood of images, the young people of this generation are becoming increasingly proficient operators of their culture’s new media, using new online networks from SchülerVZ to Facebook to communicate.² However, it has been observed that their use of new media is also linked to peer-group-related compulsive consumption.³

While current studies and findings on the cultural behaviour and particularly the media behaviour of the contemporary generation of adolescents underline the fascination that the (still so-called) “new media” hold for the young people of today, they also confirm that youngsters engage with these media in an assured manner, both in technical and in communicative terms.⁴ The results of the 2012 JIM Study of the *Medienpädagogischer Forschungsverbund Südwest* (South-Western Association for Research into Media Pedagogy) also show plainly that even though adolescents use mainly new media for information, entertainment and work purposes, their interest in using traditional media, such as reading books, has remained stable over the last ten years.⁵ In their second “*Jugend-KulturBarometer*” (“Youth Culture Barometer”) of 2012, Susanne Keuchel and Dominic Larue commented upon a finding that is of particular relevance for art education. They write: “Given how fascinated young people are by the new media, it is all the more surprising that artistic and creative engagement with these media is still relatively rare and the predominant approach to their use remains application-oriented.”⁶

1 Marquard: *Aesthetica*, p. 11 ff.; Welsch: *Ästhetik*, p. 9 ff.

2 An overview is provided in Kirchner – Kirschenmann – Miller (eds.): *Kinderzeichnung und jugendkultureller Ausdruck*

3 Cf. Großegger – Heinzlmaier: *Die neuen vorBilder*, p. 110 ff.; also cf.: Bering – Hölscher – Niehoff – Pauls (eds.): *Nach der Bilderflut*, p. 7

4 Cf. Großegger – Heinzlmaier: *Die neuen vorBilder*; Keuchel – Larue: *2. Jugend-KulturBarometer*; *Medienpädagogischer Forschungsverbund Südwest* (ed.): *JIM 2012*

5 *Medienpädagogischer Forschungsverbund Südwest* (ed.): (2012), p. 18

6 Keuchel – Larue: *2. Jugend-KulturBarometer*, p. 130; the art teacher Klaus Küchmeister shows in sample lessons how mobile phones can be used creatively and aesthetically in art classes; Küchmeister: *Handyfilme*; id.: *Ästhetisches Handeln*; id.: *Die Handykamera*

The cultural pessimism and the fear of the flood of images prevalent around the millennium also lose much of their urgency if we take into account the fact that images are always produced within cultural contexts. At the same time, images shape the cultural backdrop that itself then generates the ways in which images are approached, namely those interpretation patterns and strategies that render images comprehensible. We orient ourselves in and shape the world not only through absorbing visual impressions, but also through engaging physically and haptically with the “world”, whether by moving through space, by appropriating space or by enacting performative stagings, by creating dispositions in space, by producing images of and about the world, or by gauging the effect of the images produced in a range of different contexts.

“Reality” is created by many “active” facets and constructions, so that “visual proficiency” accordingly manifests in a range of different creative behaviours: in the way we style our own bodies, in fashion, in the way we furnish the spaces we live in – thus creating elements of our own identity. There are creative interventions, such as graffiti, and artistic engagements with the “world” using mobile phone cameras and digital image processing. Social networks such as Facebook, SchülerVZ and so on have given rise to new forms of self-representation through the ways of life and lifestyles that exist in these online dimensions.

In order to engage with our environment we need to get an idea, to “create a mental image” of, for example, the town in which we live, whether using our mobile phone cameras, a visual diary, or maybe even a drawing pad. Art education can take this as its starting point, translating our engagement with the world (something that we have ultimately always done) and our visual and haptic experience of it onto a reflective level.

Adolescents have to learn how to orient themselves in cultural contexts: in cultures that are shaped by images in a fundamental manner (such as our present one), proficiency in engaging with images is of key importance. This proficiency relates both to understanding images and to dealing with them creatively to create one’s own worlds.

A few examples will serve to demonstrate this more clearly:

A photo of Times Square in New York, dating from the years in which Odo Marquard and Wolfgang Welsch developed the concept of “anaesthetics”, shows the metropolis’s centre with its skyscraper façades and a few advertising logos. Two decades later, these façades have become screens for extensive image cycles with the *settings* of fashion and car advertising, advertisements for banks and so on. Walls of images enclose the entire square. The images give the buildings’ exteriors a structure that seems akin to the walls of murals in the ceremonial halls of baroque palaces, such as those created – to cite just one example – by Giovanni Panini in a famous painting.



New York – Times Square – 1988



New York – Times Square – 2010



Nikolaus Braun: Berlin Street Scene – 1921

The structures of Times Square’s walls of images were pre-empted in the artistic concepts of the 1920s that dealt with the metropolitan environment of “modern” man, such as the “Berlin Street Scene” painted by Nikolaus Braun in 1921.

In the 1980s, comparable creative structures set in motion the aestheticization of everyday life, especially of the world of consumption, that gave rise to the reflections of Odo Marquard and Wolfgang Welsch. A wall installation created by the video and photo artist Dara Birnbaum in an Atlanta shopping mall in 1989, in which a large number of video spots were projected against a wall to create a fast-moving “flood of images”, serves to illustrate this.



Giovanni P. Panini: Roma Antica (Detail) – um 1755



Dara Birnbaum: “Rio Video Wall” – Atlanta (Georgia), Rio Shopping/Entertainment Complex – 1989



A 17-year-old student’s wall of images – 2011

A quick glance into the bedroom of a 17-year-old student shows how intensely the environment of today’s teenagers is determined such wall designs. The student has collected a mass of photos on her wall, taken at meetings with friends or on holiday, for example; besides these pictures, newspaper cuttings, flyers and other favourite objects are also pinned to the wall.⁷ This is a way of preserving personal experiences and memories, a form of self-assurance; at the same time, however, this presentation is also aimed at visitors entering the room.

These cases already reveal the historical dimensions of everyday images, but the roots of the motifs that determine our current world of images usually go much further back. Returning to Times Square in New York, an advertisement for the fashion company EXPRESS displayed on one of the skyscraper facades

can be used as another example: the advertisement photograph shows three young women standing close together, looking at the observer. The women seem to represent three popular female types – blonde and brunette, white and black. Their pose, which appears casual and incidental, is a clear reference to the famous traditional motif of the Three Graces. Since the Hellenistic period, there have been countless realisations of this motif, from classical sculpture to the murals of Pompeii and European art from the Renaissance onwards.

Rubens’ representation of the “Education of the Princess” Maria de’Medici from his monumental cycle in the Palais de Luxembourg in Paris depicting the life of the Queen Regent, created in 1632, serves as an example. While in ancient times the Three Graces represented beauty, charm and sensuous delight, in Rubens’ depiction of Maria de’Medici’s education they appear alongside Minerva, Apollo and Mercury, granting the future Queen beauty.

⁷ For a detailed account, cf. Bering: *Andersartiges*, p. 153 ff.



New York Times Square – Advertisement by the company EXPRESS – 2010

Rubens: Maria de' Medici cycle: The Education of the Princess – Paris – 1632



It is evident that the aestheticization of the environment through images, which at the same time serve as models for self-representation through fashionable staging, is not ahistorical; on the contrary, it draws heavily on the historical catalogue of images. Knowledge of this repertoire is essential if the image-dominated world of today is to be dealt with competently.

2 The Currency of the Image

The paradigm shift that has affected the human imagination since the end of the 1980s with such wide-reaching consequences has resulted in a valorisation of the phenomenon of the “image” previously unimaginable. Furthermore, in many areas of (inter) cultural life, the image has developed into a *lingua franca*. In 1992, Mitchell thus spoke of the *pictorial turn*, which he claimed was replacing the *linguistic turn* and the associated dominance of verbal language. Mitchell started from a criticism of the philosophy of language, especially of Wittgenstein and Rorty.¹ Mitchell’s assessment that the significance of the image had risen hugely provided a framework for reflection over the following decades, not least for Gottfried Boehm, who shortly afterwards spoke of the *iconic turn*.² Recently, Mitchell himself went beyond the identification of the “pictorial turn” and subsequently call for a hermeneutic interpretation of images when he referred to the image as a “paradoxical creature, both concrete and abstract, both a specific individual thing and a symbolic form that embraces a totality”, describing its ubiquity in every cultural context.³

During the years of the *pictorial turn*, that “flood of images” arose that often seemed to overwhelm the coming generation, particularly given that the images were often linked to corresponding (imitative) behaviour – gestures, facial expressions and forms of communication changed dramatically. The image now increasingly appeared both the most important medium for the expression of cultural events and the key means by which these events could be influenced.⁴

However, images do not become accessible of their own accord – they require interpretation. This can be seen, for example, in the pictures produced by the imaging methods of medicine of the natural sciences, images that are gaining ever greater significance for our current world and lives. At the same time, it is clear that images always need a context to provide them with meaning.

This, too, can be seen using an example: if we compare a work by Gotthard Graubner, such as the 1990 “Saba”, with the view of the Orion nebula seen through the Hubble telescope, then our eyes perceive similar planes of colour: light reddish and violet

1 Mitchell: *Pictorial turn*, p. 3 ff. and Mitchell: *Wittgenstein’s Imagery*, p. 361 ff. In retrospect, however, it should be emphasised that the dominant view of Wittgenstein changed fundamentally around 1990, with greater attention being paid to the much broader range of his philosophy, especially his studies on culture and aesthetics. On the shift in the view of Wittgenstein, cf. Bering: *Wittgenstein’s Philosophy of Colour*, p. 317 ff.; Bering: *Wittgenstein als Architekt*, p. 154 ff.; Bering: “Ästhetische Rätsel”, p. 81–93 and Bering: *Rolle der Kunst*, p. 19 ff.

2 Boehm: *Wiederkehr der Bilder*, p. 31; cf. the informative correspondence between Boehm and Mitchell: *Belting: Bilderfragen*, p. 27 ff., 37 ff.

3 Mitchell: *What do Pictures Want?*, p. xvii

4 Bering: *Notwendigkeit Kultureller Kompetenz*, p. 145 ff. Cf. the articles in: Bockhorst – Reinwand – Zacharias: *Handbuch Kulturelle Bildung*; the concept behind this volume, which is intended as a compendium, simultaneously reveals that the debate surrounding “Cultural Education” still does not give the image the attention that its significance in contemporary culture would merit.

swathes of colour merge into one another, without forming contours. Lighter and darker areas create the impression of spatial deep structures. But even though there are similarities on a phenomenological level, there are huge differences between the two images: the image provided by the Hubble telescope refers to a reality beyond itself, creating a representation of this reality. This manifestation of the “image” stands within the classical tradition of Plato’s doctrine of forms and the relation it describes between image and representation, according to which the image – which represents what is – has no existence of its own.⁵ By contrast, Graubner’s “body of colour” does not refer to anything existing outside itself, instead claiming unconditional autonomy. Graubner’s works thus appears as the artist’s independent creation and accordingly enters into dialogue with its beholder. Obviously, we can only interpret the images appropriately if we are able to construct a corresponding context.



Gotthard Graubner: Saba – acrylic on canvas –
1.63 × 1.34 × 0.1 m – 1990



Hubble telescope: Orion nebula

5 Plato: Politeia 597a

3 “Visual Proficiency” at the Intersection of Different Approaches

3.1 Images and cultural contexts

The importance of images in contemporary culture cannot be overestimated, and for this reason it is imperative that art classes teach “visual proficiency”. In doing so, it is advisable to draw upon a range of different methodological and scientific approaches. One of the greatest contributions of the visual communication of the 1970s (above and beyond its political aspirations) was to open up art education to everyday objects. The inclusion of advertising, film and so on in the visual subject-matter discussed in class remained a constituent part of art education, even though the abovementioned further-reaching aims of visual communication were later abandoned.¹ At the same time, there was a shift in the way images were approached towards including historical, political and above all socio-critical questions. This paradigmatic shift in particular led to the inclusion of everyday media in lessons.

This groundbreaking reorientation of the way art was taught took place against a backdrop of extensive change in the role of images in social contexts. This trail was blazed by *cultural studies*, which had emerged in the United Kingdom and since the 1950s had dealt with the culture of the working classes, devoting particular attention to material cultures. Visual communication was able to draw upon these experiences and also incorporated aspects of the social sciences, which were expanding rapidly at this time.

Besides the studies of Mitchell and Boehm, who propagated the *iconic* and the *pictorial turn* across the globe, it was mainly US-based research on visual culture – so-called “visual studies” – that focused upon everyday and youth culture from the 1960s onwards.² Lacan and Foucault were a key influence on postmodern and poststructuralist theories, thematising identity issues, the discourse on the body and questions of hybridity and syncretism that we will return to at a later point in this study.³

Since the 1990s, cultural contexts and cultural self-assurance have formed the main focus of *cultural studies*, which by now not only are an important part of American cultural sociology, but are also becoming increasingly popular in Europe. Studies of this kind have repeatedly highlighted the relevance of images.

As far as cultural proficiency is concerned, *cultural studies* provide important stimuli for the discussion of the issues of body culture, everyday culture and media consumption. Large areas of contemporary culture – especially among adolescents – are

1 The seminal work on this is Ehmer: *Visuelle Kommunikation*, pass.

2 Cf. the critical comments made by Mitchell: *What do Pictures Want?*, p. 336 ff.

3 Bromley: *Cultural Studies*, p. 23 f.; Featherstone et al. (eds.): *Global Modernities*, London 1995. On pedagogical aspects, cf. Bredella: *Pedagogy of Intercultural Understanding*, p. 559 ff.; on the development of a concept of transculturality, cf. Welsch: *Transculturality. Changing Form*, p. 217–244

dominated by a pronounced cult of the body. If we take part in a teenage discussion about biometric passport photographs, for example, we can see the key role played by the adolescents’ image of themselves in their confidence and self-representation. The teenagers comment upon the “ugliness” of these pictures and how difficult it is to recognise the person pictured, culminating in assertions that they have been “disfigured”, even though biometric photographs claim to produce an exact image of the individual, representing random natural traits in a mathematically precise manner. The metamorphosis of the body and its image given the options of genetic engineering and digitalisation are debated hotly in parallel.

3.2 The science of the image and the science of art

During the time of the *pictorial turn*, there were attempts to establish a science of the image that had the too far-reaching aspiration – as stated by Sachs-Hombach, for example – to develop a scientific approach to images under the aegis of philosophy: in formulating a science of the image, philosophy “is of key importance [...], not only because, more than any other discipline, it addresses most of the different aspects of images (across its subdisciplines) – especially in aesthetics, the philosophy of signs or language, epistemology and the philosophy of the mind –, but also because engaging with theories of science and methodological issues is a core philosophical skill.”⁴

Within the context of this image-scientific approach, Roland Posner presents a classification of “visual skills” from a semiotic perspective, organised hierarchically on ten levels *ex negativo*. Posner takes blindness as the lowest level, identifying the lack of a “perceptual skill”. This is followed by the perception of an image *as an image*, the “plastic skill”, that is, recognising the *object* “image”; here, the question of how virtual or imagined images fit into this scheme arises. According to Posner, “syntactic”, “pictorial” and “referential” skills are needed for the perception of image content. However, this classification system makes no distinction between different types of images. Accordingly, Posner only makes vague reference to the “illocative power” of images, the intentionality of what is represented, which can only be perceived using “pragmatic” or “modal” skills.

Posner integrates his classification of “visual skills” into a multi-level categorisation of images, in which “reflection level 0” includes images that are created “without human input”, such as silhouettes or reflections. If the reflection occurs in a mirror produced by man, then “reflection level 1” is reached, followed by the second reflection level, which consists of images intended “as representations” – most of which are contained within in an explicitly mentioned frame. The third level reflects “the aim of making the observer believe that the framed image is intended as a representation.”⁵

4 Sachs-Hombach: *Wege zur Bildwissenschaft*, p. 9; cf. Sachs-Hombach: *Bild*, pass. and Sachs-Hombach: *Begriff*, p. 9–45

5 Posner: *Ebenen der Bildkompetenz*, p. 20

Reflections of this kind – as Posner’s thoughts quickly reveal – collide with those images referred to as “works of art”. Posner sees these only as “violations of the conventions of representing objects”. This, then, is the “line between images as objects of use and pictorial art” – “art” as a violation.

The question arises, however, of whether this idea of a hierarchisation of the levels on which “visual skills” are needed is viable. Posner’s classification of “visual skills” seems to be based upon models of evolutionary theory. For Posner, the key terms “image”, “aesthetically relevant” and “pictorial art” seem absolute, even though the respective contexts and discourses in which images occur are decisive for their meaning and significance. There is no reason why the interpretation of an X-ray image or the aforementioned glance through the Hubble telescope should be any less complex than looking at a picture by Malevič – and thus this hierarchy of different levels of “visual skills” should be replaced by a model based upon non-linear reasoning that acknowledges both divergent sorts of images and different discourses, especially where the discussion of works of art is concerned.

Even though the aim should be to establish a new paradigm for the science of the image, we should not forget that for generations, the understanding and scientifically oriented analysis of images have been the domain of art history and the science of art. Iconography – as influenced by Erwin Panofsky, for example, but also the research of Aby Warburg – and “the *Ikonik*” developed by Max Imdahl should be mentioned in this context. The older approaches follow traditional notions of a hermeneutics of the image; Max Imdahl attempts to describe that which is expressed genuinely by the image and the image alone:

“While iconography and iconology deduce from images what the observer needs to know consciously and what can be imparted through the communication of knowledge, the *Ikonik* seeks to highlight a form of insight that is exclusive to the medium of the image and can be gained through it alone. [...] By contrast, what appears as a totality to the *Ikonik* is not determined by a predetermined subconscious reason from which all further understanding can be deduced. Rather, totality is articulated as the perceptual unity precisely of antagonistic, dialectic constructions of meaning or bold equivalences, for the perception of which there are no ‘spiral coils’, neither a meaningful beginning or a meaningful end.”⁶

Art history is hugely important in teaching “visual proficiency” as it provides a vast storehouse of images and a broad range of methodologies, especially as the use of these resources helps to combat the latent risk of ahistorical aestheticization that is inherent in some fields of art education.

For example, Horst Bredekamp examines those “powers of the image” able to have such a strong effect on the observers that they influence their thoughts and feelings on a profound level through the “picture act” (“*Bildakt*”). Picture acts take place “schematically”, “substitutively” or “intrinsically”; Bredekamp ascribes the images a “liveliness” (“*Lebendigkeit*”) he discusses using the example of “tableaux vivants”. The analysis of the relationship between image and body underlines the theory of the “live-

6 Imdahl: Giotto, p. 97, 109

liness” of the image in a similar manner to the intensity of the potent gaze ascribed to some works.⁷

Prior to this, Hans Belting had already developed methods that went beyond the history of artistic styles to reconstruct a “history of the image” that focused upon the extremely varied functions held by the image in European social structures during the Middle Ages and Early Modern era.⁸ One of Belting’s more recent studies draws attention to intercultural contexts, analysing the relationship between image, gaze and perspective in the exchange between Arabic and Western culture during the Middle Ages.⁹

All in all, in recent years art history – starting from approaches such as these – has developed an independent science of the image that is distinct from philosophy, aiming “to develop art history further both in material and in methodological and analytical terms, based upon historical and modern cultures of the image” and to include cultural contexts in particular.¹⁰

The communication of “visual proficiency” must take place at the intersection between these methodological approaches and ways of engaging with the phenomenon of the “image”.¹¹ The aim of teaching “visual proficiency” is to enable students to independently identify links and contexts that create meaning, helping them to orient themselves in the world.¹²

However, in this context we should caution against any narrowing down of the concept of “visual proficiency”: “visual proficiency” refers not only to ways of accessing the phenomenon of the “image” and its diverse range of relations, but must also integrate creative constructions, designs, compositions and so on – all the more so as students have always engaged with phenomena in this manner.

This also shows that the concepts of “visual literacy”, first formulated in 1968/69 following a conference in Rochester, NY, do not go far enough.¹³ In analogy to programmes aiming to equip people with reading skills, a range of often vague projects were set up to facilitate perceptual skills, especially coding and decoding all kinds of visual messages, whether images, gestures, or facial forms of expression and body language. Advocates of such learning programmes aim to improve participants’ communication, teaching them to understand, interpret and produce their own medial messages within social contexts. However, students in art classes are not visually illiterate and do not need to be painstakingly taught an “optical ABC” – rather, they have

7 Bredekamp: *Bildakt*, p. 138, 173

8 Belting: *Likeness and Presence*, esp. p. 1 ff.

9 Belting: *Florence and Baghdad*, esp. p. 5 ff.

10 Kruse: *Positionen*, p. 81 f.; cf. Kultermann: *Geschichte der Kunstgeschichte*, esp. p. 216 ff. and Bering – Heimann – Littke – Niehoff – Rooch: *Kunstdidaktik*, p. 262 ff.

11 We can only briefly mention other approaches here, such as the semiotic approach – Eco: *Semiotics*, pass. – and the constructivist approach: Bering: *Kunst und Kunstvermittlung*, pass.

12 Bering: *Kunstpädagogik und Bildkultur*, p. 283 ff.

13 Summarised in Elkins: *Visual Literacy*, pass. and Pettersson: *Visual Literacy*, p. 215 ff.

grown up in a strongly visual environment and accordingly are no strangers to dealing with images. This view is supported in particular by the neurophysiological research of recent decades.

3.3 Visual proficiency and perception

Perception is the foundation of all “visual proficiency”. Given the far-reaching results of current neurophysiological research, it seems pertinent to discuss some of its fundamental positions here. According to this research, “perception” does not “function” according to the model of a *camera obscura*, but rather is constructed in the brain of the person perceiving.¹⁴ This means that the individual takes in external stimuli, which are then structured by patterns and categories that are already stored in the brain. These stimuli derive from previous experiences and produce the so-called inner representation of the world. The inner representation determines whether the information conveyed by the retina is accepted and how it is used. Wolf Singer pithily expressed the interpretation of what is perceived through the brain’s constructive activity as follows: “We do not realise that we are constructing, but instead believe that we are representing.”¹⁵

Over the course of evolution, the cortex developed – a highly important part of the brain that reacts not to external stimuli, but to the stimuli produced by the brain itself, and is thus able to engage with brain activities themselves. With the cortex, the individual’s ability to reflect both upon what he or she perceives as well as upon his or her own actions came into being. This ability and existing forms of storage now gave rise to improved ways of evaluating experiences with the world and of anticipating behaviours, referred to by Singer as “predictive models on the environment”.¹⁶ Wolf Singer also pointed out on more than one occasion that the brain’s structure is thus reflexive; it is able to constantly create new relations between the knowledge already present and new information, thus designing models for future action in the world.

What is decisive is that human beings are able to take these processes to the outside world, communicate them, and make them available to other individuals. One medium for this is language, the “symbolic encoding of relations (to) [...] penetrate our world”.¹⁷ Furthermore, Singer claims, the activities of the cortex also make constructions of reality and their “symbolic representation”¹⁸ possible that cannot be articulated using language. This symbolic representation takes place through materialisation, as reflected in the early use of tools, for the hewn rock served not only to intervene in

14 For details, cf. Bering – Heimann – Littke – Niehoff – Rooch: *Kunstdidaktik*, p. 81 ff.

15 Singer: *Bild*, p. 75

16 Singer: *Neurobiologische Anmerkungen*, p. 218

17 Singer: *Neurobiologische Anmerkungen*, p. 217; Schnotz discusses a model of the link between the processing of language and of images as the “mental construction of models”: *Bild- und Sprachverarbeitung*, p. 24 ff.

18 Singer: *Neurobiologische Anmerkungen*, p. 220

its maker’s environment, but also recorded the conditions and thoughts that led to its creation. Through “symbolic representation”, the materialisation of external storage and communication options ultimately also led to the image, as will be discussed further below.¹⁹ It is evident that human beings “create images” through a range of brain activities, and Singer highlights that there is “hardly any difference between reception and production” in neurophysiological terms.²⁰

The neurophysiological research of today is able to substantiate its theories – which are frequently seen as highly innovative – through the methods of the natural sciences, but Karl Raimund Popper was already able to explain this in the published version of his famous dispute of 1974–76 with the brain scientist John C. Eccles:

“However, the neurophysiology of the eye and that of the brain suggest that the process involved in physical vision is not a passive one, but consists in active interpretation of coded inputs. It is in many ways like problem solving by way of hypotheses. (Even the inputs are already partially interpreted by the receiving sense organ, and our sense organs themselves may be likened to hypothesis or theories – theories about the structure of our environment, and about the kind of information most useful to us.) Our visual perception is more like the process of painting a picture, selectively (where “making comes before matching”, as Ernst Gombrich says) than one of taking random photographs.”²¹

Based upon the research of Gregory, and supplemented by the reflections of Singer and others, the following model of perception and the associated learning processes can be developed:

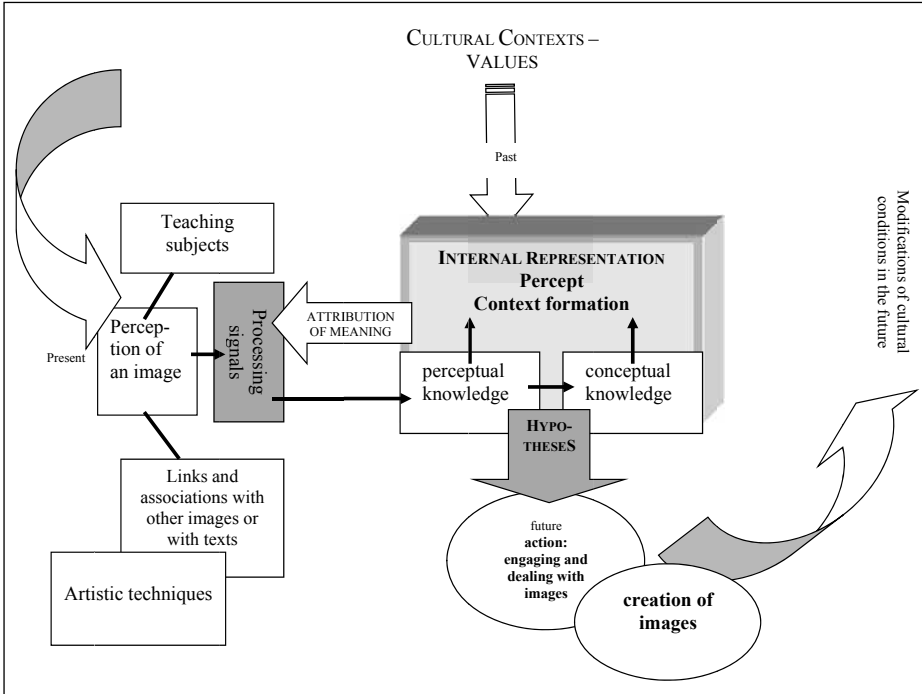
From this, we can see the fundamental importance of the ability to develop meaningful contexts based upon constructive brain activity – it is only through this that we can discover ways of orienting ourselves in the world.²²

19 For Singer, we are here dealing with “art”, but he does not distinguish sufficiently between “image” and “art”, which entails a specific cultural background and appropriate contexts and attributions of meaning arising from this background; cf. Singer: *Neurobiologische Anmerkungen*, p. 224

20 Singer in an interview, BDK-Info 2008, p. 12

21 Popper – Eccles: *The Self and Its Brain*, p. 45

22 On the criticism of using neuroscientific approaches in teaching practice, cf. List: *Text und Bild*, p. 87 ff.



Model of perception [based upon Gregory: Eye and Brain; a first version can be found in: Bering: Perzeptbildung, p. 211]

4 Foundations of the Concept of Proficiency

4.1 Basic trends in the history of education

Neither the historical nor the current discourse on the theory of education has produced a unanimous opinion on what is actually to be understood by “education”. The understanding of what is supposedly covered by the concept of “education” is historically contingent and accordingly has changed over the course of time. In the history of pedagogy, “education” has traditionally been defined in very different ways and the debate on the purpose of school education has often been – and indeed still is – one between diametrically opposed positions.¹

On the one hand, there have been calls for the educational mandate of the school as an institution to be more pedagogical and focused on individual personalities, and with a pragmatic orientation. To give a rough summary, through school education students are first and foremost to develop their individual mental and physical talents as well as instrumental skills that will enable them to deal with current and future cultural challenges. Corresponding approaches in educational theory, which scientific discourse refers to as “formal”, focus upon the student as the *subject* of educational processes. These approaches mainly inquire into the content that needs to be selected to support the development of the students’ individual personalities, the methods using which they can acquire knowledge in as independent a manner as possible, and the behaviours and actions that will help them to meet the demands of their current and future lives. Didactics based upon formal theories of education define students’ *individual* personal development and the conveying of (subject-specific) methods and strategies for action as teaching’s main priorities, and accordingly select the content through which this is to be achieved in a purely *functional* manner. Implicitly, these positions assume that the methods and strategies learned are not tied to any *specific* content and that they can be transferred to any field. Accordingly, little attention is paid to the educational effect of the respective content and underestimates the part it plays in the learning and educational process.

On the other hand, there are the “material” educational theories, the primary interest of which lies on the *objects* of education and its cultural content.² These theories focus primarily upon the question of *general education*, of an *encyclopaedic* “cultural knowledge” that it is compulsory for schools to teach, which – thus the claim – preserves and passes down that cultural content deemed to be essential in as *comprehensive* and *supratemporal* a manner as possible. The canon of school subjects, the disciplinary range of this knowledge, is to ensure that students are given as broad a *general education* as possible. For a long time, the idea of an obligatory body of cultural or general knowl-

1 Due to the marked cultural changes taking place at the moment, the concept of education is currently being discussed particularly hotly.

2 The educational theorist Wolfgang Klafki grouped theories of education into “formal” and “material” theories. On this, cf. Blankertz: *Theorien*, p. 36 ff.

edge that could be succinctly defined and canonised associated with material theories of education defined the understanding of what education ultimately consisted of. Material theories of education make the (individual) student subordinate to the *objects* of education. After completing their education, students are to show themselves to be *educated people* according to a material understanding of education through their mastery of as much encyclopaedic knowledge as possible.

Today, this understanding of an encyclopaedic, canonised “cultural knowledge” has become outdated.³ Defining a comprehensive canon that encompasses knowledge in its entirety (or at least claims to do so) and remains ahistorically valid across time can no longer answer the question of what is to be taught and learned at schools. Such an understanding of education, if it was ever consistent and useful,⁴ has now been rendered obsolete and unsustainable by today’s flood of information and knowledge, which is shaped by changing and insights and new discoveries. The dynamic progress made in the sciences, from the 19th century onwards in particular, meant that knowledge was constantly expanding, with ever new content being added and gaining significance. As a result of this growth, which by now has become exponential, the amount of knowledge available to today’s individuals has long since become *confusing*. It is no longer possible to gain any overview of the knowledge available. The *World Wide Web* has contributed significantly to this availability in the last two decades, providing its users with a huge amount of information on all conceivable fields and topics at the click of a mouse.⁵ – Nevertheless, the question of the content to be taught in schools has lost none of its significance. However, it needs to be posed anew, and in a manner that differs from the approach taken by material educational theory. In order to answer this question, we need to search for open criteria in order to determine the content relevant to teaching in a flexible manner.

From a didactic point of view – and this forms the guiding principle for the following – educational processes will only be successful if they manage to create a synthesis between *subjective* content tailored to the *individual* student and *objective* concerns guided by cultural content.

3 Dietrich Schwanitz, who taught English Literature at the University of Hamburg, made an attempt to define a canon of knowledge for the current era in 1999. Schwanitz endeavoured to sketch the knowledge that, in his opinion, should form the basis of an educational canon in Germany. – Cf. Schwanitz: *Bildung*

4 Material theories of education were traditionally associated with a bourgeois, conservative ideology that assumed its class-dependent perception, interpretation and selection of significant cultural content held universal validity and accordingly did not question them.

5 This is not to deny the gains and advantages that the internet has brought its users.

4.2 Klafki's "categorial education"

The educational theorist Wolfgang Klafki, who was later to become a professor at the University of Marburg, developed his theory of "categorial education"⁶ in the late 1950s. In it, he linked the basic thoughts underpinning formal and material educational theory, the *subjective* and *objective* dimensions of education, in a dialectic manner. Klafki's definition of education is linked to the idea that an interdependent process of interpretation takes place between human beings and the world or culture around them. "Education", as Klafki puts it, "is categorial education in a double sense of the word, in that a reality has been rendered categorially accessible to a human being, and that he himself – thanks to the 'categorial' insights and experiences he himself has gained – has been rendered accessible to this reality."⁷

The term "category" is of cardinal significance for the fundamental relationship that exists between human beings and their world or culture. Aristotle – based on the concepts of the Presocratics and debates in the Platonic Academy – understood "category" first as a "statement", then as a "kind" or "class". He believed that the basic concepts in his system of categories were able to explain all possible experiences and classify them in substantiated contexts.⁸ Kant took up this idea, and via Hegel, Nikolaus Hartmann and Whitehead in particular, the concept of categories became an important pillar of modern philosophy.⁹

Josef Derbolav¹⁰ drew upon Hegel and upon Theodor Litt's concept of education in formulating his theory of categorial education, which mediates between the individual and the world in a dialectic process. The concern here is not to convey knowledge "about the world" and thus control the world, but rather the interpenetration of *self* und *world* to structure an individual "context of responsibility". Wolfgang Klafki took up Derbolav's philosophical ideas and developed a more strongly didactic theory of categorial education, the aim of which was to bridge the Cartesian gap between *subject* and *object* present in educational processes.

Klafki's theory postulates that educational content needs to represent larger cultural issues and contexts in order to "render them categorially accessible"¹¹ in the process of school education. Accordingly, any potential educational content must always be (re-)examined and defined to see whether it "gives the student at least the possibility

6 Klafki: *Kategoriale Bildung*

7 Klafki: *Studien*, p. 44

8 Aristoteles: *Top.* 103 b 20 ff.; *De cat.* 1 b 25 ff.; 2 a

9 Kant tries to differentiate *a priori* concepts, establishing them as "pure concepts" or "notions". Thus Kant succeeds in revising Aristotle's categories: Kant: *Critique of Pure Reason* B 102 ff., 159, 378; cf. *Prolegomena* § 21, 39. Cf. Hegel: *Encyclopaedia* § 3 and Whitehead: *Process*, p. 3, 24 on the orientation on the concept of "experience".

10 Derbolav: *Versuch*, p. 17 ff.

11 Klafki: *Studien*, p. 44

of breaking through to a fundamental level, to the forces that sustain the foundations of our intellectual life.”¹²

Klafki’s theory of “categorical education” is in itself quite focused on didactics. When developing it, Klafki also conceptualised his model of “didactic analysis”, which refers to school practice even more directly.¹³ He saw this model as a tool for reflection and decision making in the preparation of classes. “Five basic questions of didactic analysis” form this model’s heart. Klafki linked these to five analytical principles: *content structure, accessibility, present-day relevance, future relevance, exemplary significance*. This provides teachers with a set of tools for selecting concrete content for classes from the wide-ranging field of their respective scientific discipline, *structuring this content in a manner appropriate both to the subject-matter and the students* (1) and *rendering them accessible* (2) to the groups of learners according to their respective learning requirements and skills. Class content is to be decided upon made based on its relevance to the students’ *current* (3) and *future* (4) lives. Furthermore, its “exemplary significance” (5) should be explored, that is, concrete subject-matter must be investigated in regard to its representativity in larger contexts and to its transferability, and a selection made based upon this.

Klafki’s model of “didactic analysis” no longer assumes that there is a defined school canon of educational subject-matter; rather, it demands that the concrete content for the respective class be selected in a dynamic process based upon the didactic legitimation of its exemplary nature and cultural significance within the students’ current and future lives. Klafki thus developed a didactic model for the selection of class content in particular that essentially is still valid today. However, the question arises of whether an individual teacher is actually able to (always) undertake this highly sophisticated legitimation of concrete class content in an adequate manner, especially in regard to its future significance. There are thus good reasons for the fact that individual teachers usually select their specific taught subject-matter from a more limited framework that is defined to a greater or lesser extent by curricula.

4.3 Robinsohn’s curricular approach

With his theory of “categorical education” and related model of “didactic analysis”, Klafki focused primarily upon the issue of the selection of educational content. In the second half of the 1960s, efforts to effect a broad reform of the education system in the Federal Republic of Germany emphasised the issue of the “qualifications” that students were to gain through engaging with the content taught in class. These “qualifications” would help students to deal with challenges arising in their current and future lives. Saul B. Robinsohn, who at this time was the director of the Max Planck Institute for Human Development in Berlin and one of the key initiators and specialist advisers of this reform movement, described this as follows: “We proceed upon the assumption that education equips individuals to deal with their situation in life; that

12 Klafki: Studien, p. 44

13 Klafki: Didaktische Analyse

this equipping takes place through the gaining of certain qualifications and a certain ‘availability’ through acquiring knowledge, insights, attitudes and skills; and that the curricula and – in a narrower sense – the educational content selected serve to provide such qualifications.”¹⁴

For his envisaged reforms, Robinsohn developed his concept of “educational reform as curriculum revision” and a “structural concept for developing a curriculum”¹⁵, in which he did away with the traditional opposition between formal and material education. In his outline, Robinsohn described education as the process of gaining a “subjectively meaningful [...] stock of knowledge on how to conduct oneself in the world”, which takes its “orientation from the body of knowledge of a given culture”.¹⁶

At this time, Saul B. Robinsohn also included “remedying ‘visual analphabetism’”¹⁷ among the tasks of education – a fact of particular interest for the art-educational concept of “visual proficiency”. Referring to the French sociologist Georges Friedmann, Robinsohn saw the visual mass media, which were expanding rapidly at this time, as main drivers of this “visual analphabetism”.¹⁸

Robinsohn listed the following three criteria for selecting educational content, all of which clearly refer to Klafki’s “five basic questions” :

- “1) the significance of an object within the framework of science, and thus as a requisite for further study and further training;
- 2) how an object serves to promote an understanding of the world; that is, provides orientation within a culture and assists in the interpretation of its phenomena;
- 3) the function of an object in specific situations of use in private and public life.”¹⁹

While Klafki’s didactic model was aimed at teachers in schools more directly, Robinsohn’s is based upon the idea of ongoing, broad and institutionalised scientific research on curricula. Both approaches have had a lasting influence upon the subsequent discourse on education in the Federal Republic of Germany, up to and including the

14 Robinsohn: Bildungsreform, p. 45

15 Robinsohn: Bildungsreform – The term “curriculum” was taken over from Anglo-American educational theory by educational discourse in the Federal Republic of Germany in the mid-1960s. It can be defined roughly as a complex educational programme linking the aims, methods and content of taught classes.

16 Robinsohn: Bildungsreform, p. 13

17 Robinsohn: Bildungsreform, p. 16. From today’s perspective, taking into account how visual media have developed and how they are handled, the term “visual analphabetism” is no longer appropriate. Even today, image-focused art didactics are occasionally misunderstood as “contributing to visual literacy”: Brenne: Kunstunterricht, p. 444. Engaging with images is part of enculturation, so that it is not possible to speak of adolescents in today’s society as “visual illiterates”; on this, cf. e.g. Bering – Hölscher – Niehoff – Pauls (eds.): *Nach der Bilderflut*; on the dubiousness of the term “visual analphabetism” also cf. “Comparative dimension”, p. 38 ff. of this volume.

18 In this context, reference should also be made to the theoretical position of visual communication, which radically questioned the traditional content and tasks of art education following its emergence in the second half of the 1960s.

19 Robinsohn: Bildungsreform, p. 47

current debate on a focus on proficiency and skills²⁰ in school education following the PISA study.

4.4 A paradigmatic shift in educational policy

Following the disappointing results of German schools and the German education system in international comparative tests (TIMSS, PISA), a radical, paradigmatic shift in German educational policy took place: the earlier focus on input moved towards output instead.²¹ Previously, Germany (or rather, its individual federal states) attempted to effect a broad, sophisticated and comparable level of education through setting binding guidelines and curricula. However, no attempt was made to systematically evaluate whether this level was reached through overarching comparative tests of groups of learners and schools. Educational politicians and theorists have identified this primary focus on input in the German school system as *one* of the reasons that Germany did so poorly in international comparative tests. For example, the “Educational Report for Germany” created after the TIMSS and first PISA study, states: “Concerning the skills and competencies that students are to be equipped with as the foundation for their personal development and the starting point for their further learning and professional success, the German school system is not very successful.”²² It is hoped that changing the system’s orientation by focusing on output and regularly and systematically monitoring it will result in a clear improvement in the performance of German schools and thus an overall improvement both of the quality of school education and of the comparability of school qualifications. So-called “educational standards” serve as parameters for output evaluation; the introduction of these standards was determined by the *Kultusministerkonferenz* (KMK; the conference of the the ministers of education and culture of the individual German Federal States) on 4 December 2003, initially only for the *Mittlerer Abschluss* – the general certificate of secondary education gained in Year 10 – in the so-called “key subjects”²³ of German, Mathematics and a first foreign language (English and French).²⁴ The highly dubious promotion of these subjects as “key subjects” was justified by arguing that “these fundamental subjects” give students “the ability to render the world accessible as useful and universally comprehensible ‘languages’”.²⁵

An expert report commissioned by the Federal Ministry of Education and Research and produced by the German Institute of International Pedagogical Research, which

20 On several occasions, Robinson already used the term “*Kompetenz*” (which can be translated as “competency” or “proficiency”) instead of “qualification”. – Cf. e.g. in Robinsohn: *Bildungsreform*, p. 13

21 E.g. Wolff: *Renaissance des Bildungsbegriffs*

22 Avenarius et al.: *Erste Befunde*

23 The definition of so-called “key subjects” is problematic. – On this, cf. Niehoff: *Bildungsstandards*

24 KMK: *Vereinbarung 2003*

25 KMK: *Vereinbarung 2004*, p. 12

was presented to the public in February 2003 in Berlin, formed the foundation for the development and introduction of these educational standards.²⁶

In the meantime, educational standards have also been adopted by the *Kultusministerkonferenz* for the *Mittlerer Abschluss* (Year 10) in Physics, Chemistry and Biology. Furthermore, there are also approved versions for the primary sector and for the *Hauptschulabschluss* after Year 9 for the subjects of German and Mathematics.²⁷ The KMK left it at the individual federal states' discretion whether they wanted to create and approve educational standards for further subjects. For the subject of art, a working group of the BDK (the German art teachers' association) developed educational standards for the *Mittlerer Abschluss*, which were adopted in 2008 at the association's annual general assembly.²⁸

Educational standards, in the definition agreed by the *Kultusministerkonferenz*, "incorporate general educational aims and determine which competencies students are to have gained through essential content by a given academic year. Educational standards focus on a subject's key areas and delineate the learning outcomes expected"²⁹. They are outcome-focused, describe an average level of achievement, and thus outline what students are to have accomplished as a rule at the end of longer school periods or when graduating from school.³⁰ At the same time, they also serve as the standard benchmarks for evaluations. The discrepancies identified in evaluations between the results expected and those actually achieved serve as the basis for the development of specific support measures, which are then to be implemented constructively and effectively in general and individual learning conditions and processes.

Based on this definition and further supplementary descriptions, the *Kultusministerkonferenz* summarises the following criteria for the development of educational standards:

"[...] Educational standards

- incorporate the basic principles of the respective subject
- describe subject-specific competencies, including the knowledge content upon which they are based and which students are to have acquired by a specific point in their educational career
- aim to promote systematic and interconnected learning and thus follow the principle of the cumulative³¹ acquisition of competencies
- set out the performance expected within the context of tasks

26 BMBF: Entwicklung nationaler Bildungsstandards

27 KMK: Decisions of 15 and 16 October 2004

28 BDK: Bildungsstandards

29 KMK: Bildungsstandards, p. 9

30 KMK: Bildungsstandards, p. 8 f.

31 This cumulativity will counteract selective learning that focuses only upon the next test or next exam, for example. In this interest of a cumulative understanding of learning, "content and processes are to build upon one another in a systematically interconnected manner; they are to be applied repeatedly and kept active" (BMBF: Entwicklung nationaler Bildungsstandards, p. 19 f.).

- refer to the key areas of the respective subject while leaving scope for the schools' pedagogical work
- describe a medium level of achievement (normative standards)
- are illustrated using sample exercises".³²

4.5 On the concepts of “competency” and “proficiency”

Educational standards' subject-specific focus on competency and proficiency has resulted in a paradigmatic shift, from a concentration primarily upon content and intent and thus on input to a concentration upon output and learning outcomes. Schools' educational remit was newly defined following TIMMS and PISA to focus upon output. In these new educational endeavours, “competency” and “proficiency” have become key terms in formulating subject-specific standards, target levels of achievement and the parameters for their assessment. In acquiring the competencies in question, students fulfil the respective standards and develop proficiency.

A necessary precondition of the identification and definition of subject-specific competencies is that agreement is achieved on what is understood by the term “proficiency”.³³ In the educational sciences, “proficiency” is still defined in different ways and interpreted in both more complex and less complex ways.

In the debate that followed PISA, the expectation of definitions of proficiency was that they should not contribute to any narrowing down of the level of school education, and that they needed to make it possible to capture individual differences in the students' learning processes and results.

Over the course of this discussion, the definition coined by the psychologist and educational theorist Franz E. Weinert, which had already been suggested for the tasks of the PISA test, gained importance. Weinert defines proficiency as “the cognitive abilities and skills that individuals have at their disposal or are able to learn in order to solve certain problems, and the associated motivational, volitional and social readiness and skills to apply this solution successfully and responsibly in a range of situations.”³⁴

Weinert's concept of proficiency is highly complex, including both the pragmatic and cognitive dimension – which can be observed and differentiated individually in students' applied actions – as well as the emotional dimension, even though it is well-nigh impossible to research the latter empirically.³⁵ Weinert's comprehensive concept of competency is closely associated with an understanding of learning based upon neuroscientific findings and summarised as follows by the highly regarded brain scientist Gerald Hüther: “We know from research on the brain: no human being can learn or understand anything long-term if it is not meaningful to them. Education requires

32 KMK: Bildungsstandards, p. 6

33 For a detailed account of this, cf. Bos et al.: Kompetenzmessung, p. 401 f.

34 Weinert: Vergleichende Leistungsmessung, p. 27 f.

35 This is not to deny the significance of this dimension for our understanding of competency and proficiency.

the activation of emotions. This argues against cramming in line with a curriculum and against the cognitive mediation of knowledge that schools rely on so heavily.”³⁶

Given the interest of empirical educational research in assessing learning outcomes (and as quickly as possible), it was not Weinert’s definition of proficiency that ultimately became dominant, but the much shorter definition formulated in 2006 by the educational theorists Eckhard Klieme and Detlev Leutner.³⁷ Klieme and Leutner define competencies resp. proficiency as “context-specific cognitive achievement dispositions that refer to situations in specific domains in a functional manner.”³⁸ In contrast to Weinert’s more comprehensive definition, Klieme and Leutner *by definition* limit proficiency to specific areas and exclude the (necessary) emotional implications of successful action. This concept of competency, reduced for the purposes of easier verification, certainly entails the risk that tests and evaluations of student performance in specific subjects – which often take place at extremely short notice – will gain the upper hand over a more educationally focused teaching of attitudes, skills and exemplary or representative knowledge contexts. Accordingly, in her prize-winning study on educational standards for art lessons “Bildungsstandards für die Bildnerische Erziehung”, the Austrian art teacher Maria Rieder lists the following risks of the current educational and curriculum reforms: a “return to the schematism and methodism of the target-focused teaching of the 1970s, an operationalist fragmentation of competencies, an increase in descriptions of sub-competencies, swelling to ‘endless’ lists [...].”³⁹

This limited interpretation of proficiency and the interests related to it may restrict the aim of classes primarily to *learning for tests* and influence their design accordingly.⁴⁰ However, the facilitation of subject-specific competencies should take place in complex learning situations over longer periods of time, and their developmental level should be observed and evaluated within complex situations.

The following aspects should play a leading role in the definition of complex competencies and skills that refer to how to deal with images, for example:

- Proficiency must be *cumulative* (building upon one another and interconnected) and must be gained through engaging with a subject’s *essential* (exemplary or representative) content and contexts.

Proficiency includes

- *Knowledge* and *understanding*, for example knowledge on subject-specific objects and understanding their relations
- *Skills* and *abilities*, for example skill in actively dealing with subject-specific objects

36 www.buddy-ev.de/news/prof-dr-gerald-huether-wird-wissenschaftlicher-begleiter-des-buddy-ev/345dd67aab4b6ea48204eb3eca36624/ (5 June 2012)

37 This interest was also pushed in educational policy within the context of the PISA debate.

38 Klieme – Leutner, cit. in Bos et al.: Kompetenzmessung, p. 413

39 Rieder: Bildungsstandards 2010, p. 237, and Bildungsstandards 2012, p. 2

40 Rieder: Bildungsstandards; Maïke Aden also deals with the risks of art classes with a narrow focus upon competencies; Aden: Risiken

- *Motivation, volition and attitudes*, for example the willingness to engage with subject-specific content and deal with it in a committed and independent manner