



## Media Pedagogy: Media Education, Media Socialisation and Educational Media

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### Abstract

*The aim of this paper is to examine the relationship between education and media. These two concepts can be combined in three ways: one can think of media education, i.e. education in the subject of mass media. One can think of media socialisation, i.e. education within the context of a media society in which pupils and students are experienced media users. Finally, one can think of educational media, i.e. media used for educational purposes.*

*After having specified these three subject areas, the paper focuses on the third subject: Media used for educational purposes. According to the paper teaching can be defined as a specialised form of communication, and the basic point of the paper is that all communication is mediated. One cannot talk about such a thing as “non-mediated” communication. Also talking or touching implies media: Language or body language.*

*Consequently, the introduction of new, digital media for teaching does not imply to make teaching more artificial or non-authentic. The introduction of new, digital media for teaching implies that other and older educational media are re-mediated.*

### Pedagogy and Didactics

The present paper is about media pedagogy and media didactics. Thus, before starting, I must specify the way in which I talk about pedagogy and didactics.

Pedagogy can be defined as the theory of education, i.e. the theory of the way in which external influence – teaching and upbringing – can change the object of this influence. In comparison, didactics can be defined as the methodology of education.

For me, the difference between pedagogy and didactics is the following: Didactics can be defined as reflection of practice, i.e. reflection concerning the way in which the teacher can realise his or her educational objective. Thus, didactics is the theory of the teacher as reflective practitioner<sup>1</sup> () specialised in education, while pedagogy is the theory of second order educational reflection, i.e. reflection concerning the unity of education and reflection of education. The subject of pedagogy is educational theory, while the subject of didactics is educational methodology.

## Media Pedagogy

What happens, when the word “media” is combined with the word “pedagogy”, i.e. when one talks about “media pedagogy”? Three things can happen. One possibility is that “media pedagogy” means that special kind of educational theory focusing on media teaching and media training. If this is the case, media pedagogy can be compared with literature pedagogy, language pedagogy, pedagogy of physics, chemistry, natural sciences, music, art, etc.

Another possibility is that “media pedagogy” means that special kind of educational theory, which focuses on teaching and upbringing in a media society. What happens to education, when pupils and students are experienced users of media? Should the teacher teach differently in this social context, for instance by training the students not to be influenced by mass media, and does the socialisation in a media society condition teaching differently, for instance by making children better informed and/or more impatient? They read books – cf. the Harry Potter phenomenon – watch television, play computer games, surf the Internet, listen to i-pod music, send and receive sms’s, talk in mobile telephones, etc. etc.

The third possibility is that the word combination “media pedagogy” means that specialised part of pedagogy, which deals with the use and role of media in education. When a teacher teaches, he or she uses media. Language for talking, blackboards for writing, body language for creating direct communicational contact – and computers, digital networks, Learning Management Systems, etc.

Thus, “media pedagogy” can be interpreted in three ways:

1. The first possible meaning is the theory of media education. How does one teach the pupils and students to use media, and how does one teach them about media as a phenomenon in society? This may be called the theory of *media education*.
2. The second possible meaning is the theory of education under those special conditions that mass media represent a special aspect of socialisation in relation to the pupils. Pupils know the world through the media, and they are experienced and competent media users. This may be called the theory of education of media socialised children, or – in brief – the theory of *media socialisation*.
3. The third possible meaning is the theory of education by means of media: How are media used in and for teaching, from school radio and school television to e-learning, e-portfolio and Learning Management Systems. This may be called the theory of *educational media*.

Thus, “media pedagogy” is the theory of education about media, it is the theory of education within the context of media and media society, and it is the theory of education with media. In the following, I will outline all these possibilities. However, I will not hide the fact that I am particularly interested in the third point: How can dissemination media be used in and for teaching?

I will however emphasize my first point of the present paper: That it is important to make a distinction between these three ways of interpreting the concept of “media pedagogy”. Much too often these three definitions are being mixed together.

## Media Education

What makes media education different from all other education? Is teaching media basically different from teaching Danish, Norwegian, mathematics, physics etc.?

For me the basic difference is more than the difference concerning subject. For me the objective is different. If one teaches Danish, Norwegian or mathematics, the objective is that the students should learn these subjects. But the objective of media education is to teach the students to deal with communication and dissemination media as producers and as users, and to become citizens in a so-called media society.

In this respect media education is much more directly related to the basic dilemma of modern education – some call it the paradox of education – that the basic aim of education is through teaching to influence the students in order not to be susceptible to influence.<sup>2</sup> The dilemma of education is through communicative influences to make children free citizens. This is of course the teleological dilemma of all education. But in media education this is very present in the curriculum. Here, teachers use media to influence students in order not to be susceptible to mediated influence. Here, teachers aim to make students interested in media, while simultaneously teaching them to distance themselves from the influence of media.

Sometimes, the administration of this dilemma has been called “housewife research”.<sup>3</sup> On the one hand one tries to prevent children from what is seen as the harmful influence of media, on the other hand one introduces children to the fascinating world of mass media. What is the objective of teaching computer games? Is it to prevent children from playing computer games, or is it to support their game abilities and aesthetic competencies in relation to computer games? As I have suggested, this dilemma is not unique for media education, but it represents a general pedagogical dilemma. However, the dilemma is particularly obvious in media education.

Sometimes the dilemma is managed by simply choosing a particular position. Then, the objective of media education is – as it is often expressed – to turn children into “critical media consumers”. They should not become “victims” of newspaper advertisements, television commercials or Internet banners, but should be able to see through the tricks by learning their communicative effects. Commercials should not be loved, but unmasked.

In this respect media education is different from other school subjects. The objective of mathematics is not to create critical mathematicians; the aim of literature is not to educate children to establish a critical distance to fiction writers such as Shakespeare or Hans Christian Andersen. The literature teacher does not aim at critical readings of *The Ugly Duckling*, but aims at stimulating love and fascination. But the media teacher certainly wants to stimulate critical reading of *The Sun* or *Disney* commercials, and he leaves very little room for fascination.

Sometimes this dilemma leads into a division of the subject into two parts: A production part and a reception part.

In the production part children are educated to be able to manage media production tools, not least computers. Here, the curriculum includes teleological as well as aesthetic elements. One should be able to use the computer in a targeted way in order to produce the result aimed at. And one should know and admire media aesthetics in order to create beautiful and fascinating products.

In the reception part children are educated in order to become sceptical media consumers. Here they do not produce media effects; here they unmask these same effects. Here they are not supposed to be fascinated, but critical.

How does one manage such dilemmas or, as they are sometimes called, paradoxes? The rational approach would suggest that dilemmas or paradoxes

should be solved or “untied”. But what do you do, if the paradox is a real one, i.e. if it is inextricable? Then one has to try a radically different strategy: To make the dilemma or paradox invisible. And this is exactly what the educational system does.

Niklas Luhmann expresses this approach in the following way:

Das Erziehungssystem hat eigene Formen des Umgangs mit Paradoxen entwickelt. Es nennt sich zu diesem Zwecke “Bildungssystem”. Dabei geht es vor allem darum, die Paradoxien zu entstören und sie so weit zu invisibilisieren, daß sie unbemerkt bleiben können. Oder anders gesagt: die unergiebige Kurzzeitoszillation im Paradox muß ersetzt werden durch Problemstellungen, die mit Hoffnung auf Lösung der Probleme ausgestattet sind.<sup>4</sup>

In a free translation Luhmann says: The educational system has developed its own ways to manage paradoxes. In this respect the educational system calls itself the system of “Bildung”, i.e. of general cultivation or cultural education. The strategy is to avoid that paradoxes make too much noise, it is to make them invisible so no attention is paid to the paradox. Or, otherwise expressed: the unpleasant short time oscillation of the paradox has to be replaced by articulations of the problem, which couch the problem in a hope for solution.

Thus, the general answer to the dilemmas or paradoxes of education is: Bildung, i.e. general cultivation or cultural education, as a communicative trick. “General cultivation” is a contingency formula,<sup>5</sup> which makes it possible to communicate about education as if it was not inherently paradoxical. What is the objective of education, is the question. Is it: To form children in a certain way, or is it to make them impossible to form? The answer that covers this dilemma is: Bildung.

The inherent dilemma of media education has a similar solution: “Media Bildung” or general media cultivation. This specific contingency formula covers the doubleness of fascinated media production and sceptical media reception.

## **Media Socialisation**

All teaching presupposes that the teacher makes a “picture” of the pupil. If the objective of teaching is to change pupils into certain directions, i.e. to meet the aims of the curriculum and to make the students learn certain things, then the teacher must act as if the student is a simple device.

However, the teacher knows that this isn’t the case. Students or pupils are not simple devices or trivial machines, but non-trivial devices. When students are influenced by the interaction of the teacher, they will react in non-foreseeable ways. “Their reaction on impulses will always be mediated through self-reference. That is: They will ask themselves what they can do with – or should understand – a certain input, and they can react on the same input in different ways at different moments.”<sup>6</sup>

Thus, often the teacher interacts with the students or pupils as if they were, what they are not: Trivial devices. He asks them what two times two is, knowing that there is one correct answer, or he asks them when Homer was born, knowing that the one and only correct answer is: “That is not known”.<sup>7</sup> Translated into categories of knowledge, the teacher interacts with students as if all knowledge is factual knowledge, although it is well-known that this is not the case.<sup>8</sup>

This, thus, represents another inherent dilemma of the educational system: That teachers interact with students as if they were trivial devices, knowing that in reality they are non-trivial devices. They communicate with students as if communication is transportation of knowledge, knowing that the basic condition of communication is double contingency: The teacher cannot observe the learning processes of the student, and the student cannot observe the intentional processes of the teacher's selection of communicative utterances.

Again, there is no easy solution to this dilemma. One would not like to – and actually could not – transform students into trivial machines (although sometimes this seems to be the implicit effect of the intentional structure of the educational system). Still, however, one wants them to learn what they have been taught.

The answer to the dilemma, that the structural coupling between the communication system of the class-room and the psychic system of the student is both necessary and impossible, is to perform yet another communicative trick, i.e. to translate the contingent human being student into what Luhmann calls a “person”, that is into a communicatively accessible instance. The mechanism is that we simplify the other in order to make communication possible, while we know that by doing so we reduce the other to something that he or she is not.

This is of course even more acute, as teachers do not communicate with one student at a time, but with several students. The challenge of the teacher is not to interact with one non-trivial device, but with a non-trivial system of non-trivial devices.

Consequently, one of the activities often seen among teachers is to make general characteristics of pupils. They are characterised as “...the children of our time”. To interact educationally with children in a classroom the teacher has to typify them, for instance as “competent”, “narcissistic”, “early matured”, etc. Similarly, teachers often talk about the characteristics of a whole class: “This class is good, that other class is lazy”.

In order to perform this communicative trick, the individual children must be seen as a product of a common cause. They are supposed to be “socialised”. The idea of socialisation is, among other things, a trick used by teachers to categorise pupils and students under a common denominator. One can then talk about spoiled children, second-generation immigration children, working class children, academic family children etc. And one can generalise children into children belonging to certain generations: Critical generations, happy-go-lucky generations etc. Doing so, the teacher can so to speak communicate with what is believed to have conditioned the children. Instead of looking into their souls – finding nothing – they can look into their social environment.

In this respect so-called “media socialisation” is a communicative trick. It is a way of reducing children into a simple category, thus acting as if classroom teaching is possible. In order to construct the generalised communicative other, one can include him or her into the media socialised general other and act in correspondence with this generalisation. He or she can be said to having been socialised through media, and to having made his or her world experiences through media. Students of our times are “products of the media”, “Disney-fied”, they are “in lack of first order experience”, etc.

But isn't this true? No, if it is correct that society and humans – psychic systems – are mutually closed systems, human beings are not a simple product of society. Norms, patterns, traditions etc. cannot be transmitted from one generation to the next. Rather, the mechanism of socialisation should be analysed as a mechanism of expectations.<sup>9</sup> The child or the young person can

observe the communication of the older generation, the teachers or the other young people, and he or she can react through adaptation or deviation. Should I accept their communicative offer, or shouldn't I?

This is of course also the fact at the next level of observation. The young person observes the expectations of the other, or he observes the reactions from the other on his being this or that.

In this respect socialisation is more "free" than education. Socialisation is characterised as structures of expectations, but whether the other fulfils your expectations is not important. Actually, it may be seen as positive if the other deviates from the expected outcome.

But education is goal-oriented communication. Children and students should learn something according to the curriculum, and they may react against these objectives. Therefore, as Luhmann notices, it is an old pedagogical trick to organise education as situations, which are supposed to actualise a certain socialisation potential. One might for instance identify pupils as media society children and provide them with computers, mobile telephones and treat them as experienced media practitioners – and this might then have a positive outcome in relation to the curriculum.

## **Educational Media**

Until now I have looked at the two first aspects of media pedagogy: Media education and media socialisation. Media education is about the way in which teaching students how to use media can be organised and practised. Media socialisation is about the way in which teaching can be organised and practised, assuming that students have a common socialisation in media and in media society.

The rest of the paper I will however devote to the third subject: How to use media in and for education. I will do so by discussing the question: What is a theory of educational media, that is a theory of teaching which has a special focus on the use and function of media in teaching?

On the face of it one should think that this would be a theory about the special and atypical type of teaching that is performed by means of radio, television and new, digital media. Thus, this would be a theory about school-radio, school-television, distance learning, computer-supported learning, etc.

However, I would suggest that a theory about educational media should have a much broader definition. It is my hypothesis that all teaching is teaching using media, that is, all teaching is mediated. I would like to draw a sketch of the dimensions of that particular field of pedagogy, which can be called the theory of the function of media in upbringing and teaching. I would suggest that six dimensions could be identified:

- First, I will argue that all teaching is mediated. This is the basic statement of media pedagogy.
- Second, I will describe the functionality of media in teaching as a specialised form of communication: Why are media used?
- Third, I will look at the reflexivity of educational communication. I will demonstrate that educational communication includes first order as well as second order reflection, and that educational media should make reflections at both levels possible.
- Fourth, I will analyse the basic aspects of education, namely the mediation of the relations between student and subject, teacher and student and teacher and subject. Each relationship calls forward a specific media type.

- Fifth, I will clarify the dimensions of educational communication, i.e. that one dimension of education is the one connecting rules and self-organization, while the other dimension is the one connecting virtuality and reality, and I will demonstrate the way in which educational media mediate these dimensions.
- Finally, I will look at the theory of educational media from a media specific approach. I will analyse a couple of specific examples of media genres such as playgrounds and computer games in order to demonstrate the analytical potentials of the above-mentioned concepts and categories.

### **All teaching is mediated**

It is often heard that one can make a distinction between mediated and non-mediated communication, and thus between mediated and non-mediated teaching. The idea is that there is some kind of particularly “authentic” interaction and teaching, one in which the social distance between the communicators – e.g. between teacher and student – has been eliminated. They have established an “authentic” relationship.<sup>10</sup>

For me, this is an illusion. All teaching – and all communication – is mediated. Also when sitting in front of the particular other in an educational relationship, this relationship is mediated. Yes, the very fact that this relationship is not any relationship, but a relationship of upbringing or teaching, represents a mediation. Also when talking to each other, verbal language, gesture etc. are media. Thus, all education, and indeed all communication, is mediated.

One could of course reply to this position that there is a marked difference between on the one hand language, gesture etc. and on the other hand technical media such as printed books, broadcasting programmes or e-learning systems. For me, however, it is important to emphasize that language, gesture and technical dissemination media are related. First of all, they are evolutionary related. No communication media is “authentic”. Language is a product of social evolution as well as the Internet. Secondly, they are functionally related. They are means for making communication less unlikely.

This position can be substantiated as follows. Education, i.e. upbringing and teaching, is a particular form of communication, namely that form of communication whose objective is to change individuals (pupils, students, adult students) into a certain direction. More precisely, teaching is a specialised form of communication whose objective is based on a pedagogical intention to provide a person or a group of persons with knowledge and/or abilities.<sup>11</sup> This in itself represents a mediation. Educational communication occurs in the medium of a code, through which one can decide, whether this communicative action actually is teaching, or something else. Also, based on the code one can decide, whether the communication was successful. Did education actually happen?

Thus, just by being “education” and not conversation, negotiation, decision-making etc. the communication is mediated, because one code and not others is applied.

In addition, however, we know that the possibility for this communication to be successful is limited. When one educates a child, it is difficult to say, whether the upbringing is a result of the child’s self-socialisation, or the result of the specific educational communication. Is the child taught to walk, or does it learn – does it teach itself – to walk? Is it taught to talk, or does it learn to talk? Here, it is relevant with Luhmann to say that teaching is a specialised expression of the general improbability that “systems understand systems”,<sup>12</sup>

i.e. that one closed system should be able to observe another closed system in such a way, that the result is understanding. Yes, it is a piece of disingenuousness to say that one psychic system observes the other. Rather, one system, i.e. the pupil, observes another system, namely the system of educational communication, personalized in communicative decisions made by a generalised other: The teacher.

In order to generalise this position, one can say – as does Luhmann in *Das Erziehungssystem der Gesellschaft*,<sup>13</sup> – that the theory of education must make use of two basic concepts: Operative closure and structural coupling.<sup>14</sup> The concept of “operative closure” characterizes both the child and the educational communication. The child is a closed system, which based on its own operations, i.e. based on preconditions that it can only create itself, observe communicative operations in its environment. My one-year-old grandchild obviously observes what I am doing and saying, but what she actually sees and understands, and why she reacts in one particular way and not another, is not observable for me. I can see *that* she observes, but I certainly cannot see *what* she sees or *why* she reacts in one way or the other. Suddenly she makes an utterance. But why did she do it now and not a month ago (actually I have said “book” hundreds of times, when she points to my shelves, without any other reply than what I interpret as “what’s that?”) is beyond the potentials of my understanding. Certainly, however, it is the result of her own operations and not of my utterance: Something in her makes her react.

In a similar way one can think of the educational communication as an operatively closed process, the environment of which is – children. The teacher talks, demonstrates, makes gestures and drawings on the blackboard, but whether this affects the pupils, and in which way it does so, is in principle impossible to know. And seen from the position of the children communication occurs – just think of my grandchild – but how should it be understood?

However, the result is not an absurd Leibnizian dance of isolated monads. The idea is that contact is made, but not in the sense of causal input-output processes, but in the sense of structural couplings. A “structural coupling” is a coupling made by one system and based on operations of this particular system. I observe my environment through the operations of my cognitive system, not as the environment exists “an sich”. And of course I observe myself observing my environment.<sup>15</sup>

Structural couplings can have two different basic effects. One is that one system limits the operational potentials of the other system. Although I – and not my brain – think, in order for my cognitive system to work it must make structural couplings to the neural processes of the brain. Consequently, not everything can be seen and thought. For instance, what I can observe is limited by the visual potentials of my eye. Similarly, in order to be systematically stimulated to learn, the child must go to school. But staying at school the child is not allowed to leave the classroom, and the learning stimulation couplings are limited to what the school offers.

The other effect, which I have already indirectly mentioned, is that one system provides resources to the eigen-operations of the other system. In order to think, I must have a brain with a complex system of neural operations, but – as already said – it is not the complex system of neural operations that thinks, but “me” that do so thanks to the resources provided by my neural system. The social system communicates, but it does so thanks to the resources provided by the structurally coupled individuals – or psychic systems – in its environment. When observing the educational communication the child can observe phenomena that can be used as resources for its own operations. The



small child can copy the sounds and gesture of the adult person and use this as resources for its own, continued eigen-operations.

Also in order to make structural couplings possible media must be applied. Media are so to speak the evolutionary outcome of structural couplings, and it is the function of media to make the improbability of successful communication less improbable. In the educational context media are used in order to make it more probable that the educational communication has the premeditated effect. Indeed, educational communication is mediated. We all know that we talk differently – more clear, more simple and with a more explicit orientation towards the intended effects – when we talk to a child within an educational context. However, mediation of educational communication is not an exception. On the contrary: All communication is mediated. Such a thing as unmediated communication does not exist.

### **Educational Media: Dissemination, Understanding and Effect**

An analysis of communication, both in general terms and in relation to the special type of educational communication – implies that three types of improbability for successful communication can be identified.

Just think of the normal classroom experiences: First of all, it is not probable that the pupils should hear what is being said. Secondly, it is not probable that they understand, what is being said. Thirdly, it is not very likely that the children – if, against all odds, they have heard and understood what was said – react to what has been uttered in accordance with the intention of the communication. This can be illustrated by Luhmann's own example from the evening meal in his family. When he said to the children that they should wash their hands, they didn't hear it. They were too busy doing their own things. When they, after all, heard what he said, they didn't understand it. They looked at their hands and simply couldn't understand what was meant. "Dirty? What do you mean?" And when they finally understood it, they didn't react accordingly, but continued doing what they thought was more important, silently backed up by their gentle mother, who let the family understand that it wasn't after all *that* important.

A similar example has been provided by Søren Kierkegaard. He presented one of his ethical essays to a person, he knew – but obviously didn't admire. In the book he made the following dedication: It is not likely that you take the time to read the book. If you do so, you probably will not understand it. And even though this should be the case, you certainly will not change your lifestyle accordingly. However, he sarcastically added, I believe that you will be pleased to note that it is bound in chamois with gold-printing. Again, there are three improbabilities: The improbabilities of being heard, understood, or accepted and followed.

Based on these three types of communicative improbability, which also characterises educational communication, three types of media can be identified:<sup>16</sup>

- It is improbable that the child hears, what the teacher says, i.e. that the message reaches the addressee. Consequently, dissemination media (writing, printing, loudspeakers, broadcasting) must be used.
- It is improbable that the child understands, what the teacher says. Consequently, media of understanding must be used. The basic medium of understanding is language, but in the educational context it is concepts related to the children's world of experience.
- It is improbable that the child reacts in accordance with what the teacher says. Consequently, effect media must be used. These are techniques of persuasion, rhetoric etc. At a societal level it is the

development of symbolically generalized communication media, i.e. media that are functionally adequate to a particular set of problems.

Summing up, the theory of educational media can be defined as one part of the general theory of media pedagogy. The theory of educational media includes firstly that particular form of communication that has developed as a result of the functional differentiation of upbringing and teaching with its special code, intentionality and application of specialised roles. Secondly it includes a specification and analysis of those media of dissemination, understanding and effect, which have emerged for educational communication, and the ways in which they are used.

If the general theory of the emergence of media as an answer to the improbabilities of communication is specified in relation to educational media, one should start by looking at the classroom as a system of interaction.

Also in this interaction system three media types can be identified:

First, the teacher must speak so loud that he can be heard by the students. Also a particular asymmetry must be established allowing the teacher to talk, while the pupils must raise their hands in order to contribute. Finally, the physical and organisational classroom can be analysed as a dissemination medium. The students are organised so that they can see the teacher, but cannot necessarily see each other. The teacher stands on a raised platform with his desk and chair. He speaks, as tradition says, “ex cathedra”. And he has monopolised the specialised teaching dissemination media: The blackboard, the overhead projector, the maps, etc. Thus, the particular physical and social design and organisation of the classroom is part of the dissemination aspect of educational media.

This can as well be found in e-learning systems. The most important point is that with e-learning the teacher can reach the students independently of time and place. Also, in learning management systems the roles are not equally distributed, but the teacher has certain “rights”. However, one of the problems with e-learning is that the teacher cannot tell whether the students are connected or not.

Second, the teacher must do his best to make himself understood. He must use concepts that the pupils are expected to understand, and he must refer to examples from the children’s world of experience and relevance. We all know that abstract decimal fractions are “translated” into pieces of layer cake, and that technical terms are coupled with terms from everyday life.

A basic characteristic of communication is that understanding must always be checked. “When one communicative action follows another, it tests whether the preceding communication was understood. (...) The test can turn out negative, and then it often provides an occasion for reflexive communication about communication. But to make this possible (or to make it unnecessary) a test of understanding must always accompany, so that some part of attention is always detached to control understanding.”<sup>17</sup> We know this mechanism from the turn taking theory. Communication is structured into turns, and it is important for the speaker through small signs of communicative acts to see that he is actually both heard and understood. In educational communication this is formalised into phases of question-answering, but also into systems of tests and examinations. Thus, tests and examinations are not, as reform pedagogy might have it, means of rigid control and suppression, but are ways to test that educational communication is successful.

Also, the aspect concerning media for understanding can be found in e-learning systems. The most obvious example is that educational concepts and themes are translated into concepts and themes closer to the experiential

world of the pupils. The best-known case is Seymour Papert's classical "Turtle Talk". Here, mathematics is translated into movements on the screen, and it is asserted that children understand moving images better than mathematical formula. Adding to that it is believed that they prefer anthropomorphised animals for abstract graphs, thus raising the level of relevance of the communication. Other examples are simulation systems, which of course are nothing else than translations from one medium into another. However, one should bear in mind that nothing can be translated from one medium of understanding into another without side effects. Meaning is bound to a particular context, and with e.g. "Turtle Talk" the risk is that children believe, it is about the life of turtles and not about universal mathematical principles.

One of the inherent problems of e-learning systems is to support the test-of-understanding aspect. Normally, understanding is tested by the application of secondary observation media. This can be done thanks to the physical presence of teachers and students in the classroom interaction. The teacher can observe the level of interest and/or absence of the students by observing their eye-contact, the nodding of their heads, and their small communicative expressions of being present. This is difficult to do in e-learning systems. The reason is that reflexive communication of communication often happens in supplementary observation media, which are often absent in digitally mediated interaction. One speaks to another person through the telephone, wondering whether he or she actively listens, or is busy doing sometimes else. In e-learning one misses the second, reflexive medium of eye-contact, of the pupils nodding their heads etc. This is sometimes compensated for by the development of formalised test systems. However, the cost of doing so is that a signal of miss-trust is sent.

Third, the teacher must try to overcome the third improbability of communication, the creation of effect. Even when the students hear and understand what is being said, they do not necessarily follow the teacher. Here, effect media must be applied. The teacher aims to be appealing and convincing, i.e. to create an effect. He talks appealingly to the children, he uses a wide repertoire of rhetoric means, and he would – at least in earlier days – use sanctions or rewards in order to be successful.

According to Luhmann, the most important means in society of motivating acceptance is the emergence of symbolically generalized communication media, i.e. media that are functionally adequate to the particular problem addressed in the act of communication. This mechanism can be found in the functional specialisation of teaching. One lesson is about mathematics, another concerns literature, and it is obvious that this increases the motivation for acceptance, particularly, of course, if participation is based on free choice.

However, in an educational context the most important means to create effect is the physical presence in the classroom interaction. To make a promise – e.g. the promise of doing as one has been told – the physical proximity of the other is important. Therefore, rituals of promise often imply physical contact, including ritualisation of potential sanctions. I touch your shoulder with my sword, when you promise to support me as head of the club. In mafia contexts, offers that cannot be refused are followed by highly ritualised hugs and kisses.

Looking at e-learning, it is difficult to compensate for the physical presence and thus to create effects and motivate acceptance. Often, the reaction is to supplement e-learning with physical presence, that is to practice so-called blended learning. In this way one benefits from the strong potentials of e-learning, that it is an excellent dissemination medium, because it combines the bridging of physical distance with the personal contact, at the same time as compensating for the disadvantages of the e-learning medium, that it is difficult to use as an effect medium.

But of course e-learning systems aim at compensating for the weakness of the effect function, for instance by increasing its fascination potentials and by including mechanisms of reward and punishment. The most well-known mechanism is to use the genre of computer games for educational purposes. One can appeal to the engagement of the pupils, and one can include mechanisms of reward and punishment, which would otherwise not be accepted within a reform pedagogical context.

### **Reflexivity**

We have now identified the particularities of educational communication and of education as a medium for communication. We have also analysed the improbabilities of communication in general and of educational communication in particular, and we have specified the three basic medium-forms of educational communication: the dissemination-medium form, the understanding-medium form, and the effect-medium form.

However, it should also be emphasized that teaching – as communication in general – is reflexive. All communication implies communication about communication, as Watzlawick once said.<sup>18</sup> In educational contexts it is obvious that both students and teachers know that this is the case, and that they act in accordance with this fact.

Concerning the classroom interaction, Luhmann talks about "wahrnehmen des wahrgenommenwerdens",<sup>19</sup> that is the fact that the child perceives being perceived, that the pupil or the student is aware of being observed. We know it right from the early upbringing. The child puts on its well-behaved manners, when it is being observed by adults – or it might on the contrary make faces of the expectations of the educational view. We know it from the classroom interaction, where pupils can avoid being observed by looking into their papers, or where they can try to catch the eye of the teacher in order to catch his or her attention. The trick is to be observed in the right and not in the wrong moment. We know it when the pupils get home from school making ironic remarks about the teacher. "What did the teacher say about today's poem?" the interested parents might ask. When the child answers: "Blah, blah, blah", both parties know that the child – consciously or unconsciously – has practised the art of surviving tedious communication without letting others know that this is the case.<sup>20</sup>

But also the educator and the teacher know that this is the case. He or she knows that the pupil observes the observation of the teacher. They both know that teaching is a game, that is a performance in front of an audience, although the contract between actor and audience is different from the contract between teacher and pupil. The teacher acts. But in the classroom the audience should not be entertained, but educated.

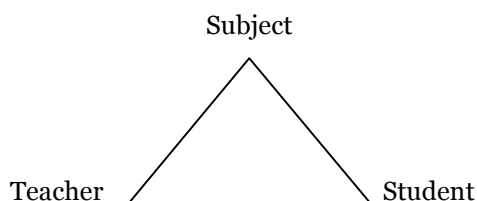
Thus, teaching and education is characterised by double reflexivity, or by first and second order reflexivity. Both parties mutually observe the other's communication, and they observe that this observation is being observed. Consequently, educational media must be able to make this double reflexivity possible. That kind of distance education medium that makes this reflexive look impossible is not an appropriate medium. It must support the signal from the pupils that they know that they are being observed, and it must support the signal from the teacher that he knows that the pupils know and signal this.

## Communicative relations: Student-subject, student-teacher, teacher-subject

I have looked at education as medium, at media for education, and at the reflexive potentials of educational media.

However, educational media are also influenced and formed by the fact that they media different communicative relations.

In pedagogy one often talks about the educational triangle between student, teacher and subject. There are three different communicative relations, one relation between the student and the subject, a second relation between the student and the teacher, and a third relation between the teacher and the subject. For each of these relations specific types of media can be specified.



The relationship between student and subject is mediated by that type of media, which according to tradition are called “educational material” or “learning” means. In system theoretical terms educational materials, for instance textbooks, can be defined as a medium that makes structural coupling between science and education and between subject and student possible. Let me use the textbook in mathematics as an example. First, it functions as a “book of translation” or a “book of transformation”. It is based on scientific evidence, but it translates or transforms this evidence so that it can be understood and appreciated by the pupils. Second, it is a “book of intentionalisation”. In principle it is only interested in scientific evidence in so far as this can be used for changing or developing the pupils into the intended direction, i.e. stimulate them to learn mathematics according to the curriculum plans.

In the era of electronic media digital textbooks are supposed to support the same double structural coupling. First of all scientific evidence is popularised through visualisation etc., and it is made relevant by being integrated into a narrative context. Second, it is intentionalised by being structured into bits and pieces that fit into the curriculum structure. Computer game based teaching material is an obvious example of this. The student can enter and explore a visualised world, where he or she can solve problems, score points and reach the next game play level.

The relationship between student and teacher is mediated by that type of media, which according to tradition are called “instruction” or “teaching” material.<sup>21</sup> One might call these media “dramaturgic” media, because it is their function to support teaching as a specialised type of acting. In this sense the teacher’s podium, blackboard, chalk, overhead projector, pointer etc. – “instruction materials” – should be called instruction or teaching media. Even the classroom in its physical layout is a medium – a stage – for teaching.

Only with new, digital media it has become possible to transform the classroom interaction – i.e. the mutual observation of persons being present – into a mediation of persons who are not physically present. With new, interactive dissemination media students at one place can observe a teacher at another place, or students at one time can observe a teacher teaching at another time of the day. Of course, one of the challenges is to make interaction possible, that is to allow students and teachers to act in first and second order

reflection modes (cf. above). Learning management systems are systems aimed to transform classroom interaction into mediated interaction between persons who are separated in time and space. Actually, traditional textbooks can be defined as media for a teacher's interaction with a pupil, from whom he is separated in place and time. However, most often textbooks are designed in order not to replace teaching, but in order to support teaching.

Finally, the relationship between teacher and subject is mediated by that type of media, which can support the teacher's management of the subject. The most obvious example is the so-called "teacher's book". Here, the student's textbook is supplemented by a book for the teacher. This is a book with ideas and instructions for the teacher: How should he understand the scientifically based subject, how should he make the best use of the textbook, and how should he organise and stage his teaching? Also, this type of medium can give solutions to the textbook assignments, provide additional material and perspectives to the subject, or support the teacher with examples, pictures, suggested work forms etc. In some extreme cases the teacher's book is a teaching manual.

Of course, the "teacher's book" concept can also be found within the realm of digital media, often with instruction tools, CD-Rom or DVD materials or with links to network-based digital resources. Also, however the relationship between teacher and subject can be mediated more directly by providing the teacher with production means for his or her own production of teaching material.

Summing up this section, three types of educational media can be identified:

- Learning or mediation media – textbooks etc. – for mediating the student-subject relationship.
- Teaching media – teaching equipment – for mediating the teacher-student relationship.
- Subject production media for mediating the teacher-subject relationship.

In addition to their individual qualities, all these three types of media are characterised by their intentionality, that they are aimed at changing individuals according to curricula. They are also characterised by being supposed to reduce the three improbabilities of educational communication: dissemination, understanding and effect.

### **Rules/self-organization, Reality/virtuality**

In addition to the above, I will make the assertion, that education can be characterised in relation to two dimensions, which both are relevant for the understanding of educational media. One dimension is the one between rules and self-organization. The other is the one between reality and virtuality.

I would claim that this distinction between rules and self-organization or between hetero- and self-organization corresponds to the distinction between game and play. In the game, rules are pre-defined. One cannot change the rules for soccer or chess while the game is going on. In contrast, in the play the participants create – or at least negotiate and modify – the rules while the play is going on. One can play Indians and cowboys while negotiating and changing the rules for being dead and alive. "You have to hit me harder, in order to kill me". Or: "I have already been dead for ten minutes. Now I am allowed to join the play again."

All teaching can be placed on the scale between hetero- and self-organization, i.e. between gaming and playing. Teaching is a game in so far as the rules are

defined in advance, or in so far as the definition of rules are monopolised by the teacher. However, teaching can also look like play, for example because the pupils can appeal for the rules to be changed. “Shouldn’t we just talk?” the pupils might ask, or: “Shouldn’t we decide that the pupils are decision-makers today?”

All teaching can also be placed on the scale between reality and virtuality. Education in democracy is not necessarily democratic, and education concerning pollution does not pollute. Education is a game or a play, it is not reality. The reason why education is separated from reality is that reality is irreversible, while things can be repeated in another way or even reversed in education. Thus, education is necessarily “about” reality or “as if” reality, no matter how much reform pedagogy long for reality. Soldiers have to read about war and simulate war before going to the war.

What has this to do with media? I think it is illustrating to look at the computer game as educational medium. Let us imagine a multi-user game that simulates organizational communication, for example a game for pupils who is supposed to try how democratic communication functions. Or it might be a game for employees in an organization, who are supposed to go through a number of organizational scenarios.

A multi-user computer game is a medium, which regulates the relationship between the actors and which stimulates the actors to reflect their mutual relations. In some cases the game rules are defined *ex ante*. Then the game is like football or chess. In other cases it is possible to negotiate and modify the rules during the game. Then it is rather like a role-play. Often, both things are possible. Then it can be called a “game-play”.<sup>22</sup> No matter how the multi-user game has been constructed, it supports the reflection of the relationship between necessity and emergence, i.e. between hetero-organization and self-organization. By playing the game – or the play – one can observe oneself as a game-subject choosing between accepting the rules of the game or trying to change these rules.

In addition, the computer game – not least that special kind of computer game called “pervasive gaming” – is placed on the dimension between virtuality and reality. Pervasive gaming is a type of computer game, which does not happen in the virtual world, e.g. on the computer screen, but which happens in the real world. As an example one can play multi-user war-game by using a GPS-system and handhold computers. The basic effect of this is that the unbearable easiness of the game – that it is reversible, that is doesn’t have consequences, but can be re-done – is being confronted by the irreversibility of reality, no matter whether this irreversibility is based in space or time. One cannot revert time or be present at more than one place.

One example is provided by a simple, early and successful example of pervasive gaming: Tamagotchi. The simple rule of the game is that the player is supposed to keep a physical avatar alive by feeding and stimulating him/her. If one doesn’t manage to do so – for example because it has been forgotten or hasn’t been stimulated in time – the Tamagotchi dies.<sup>23</sup>

In this way the computer game as educational medium illustrates the classical relationship between virtuality and reality in education. On the one hand it is, as already argued, necessary for education to be virtual. On the other hand this is the weakness of education: That it isn’t “real” or “serious”. With pervasive gaming the relationship between the aesthetics of education and the irreversible necessity of reality can be thematized.

## Media genres

Until now I have tried to present the dimensions of a theory of media education, media socialisation and educational media. In this final section I would like to present the subject from the point of view of a number of specific media genres: Children's film, museums, playgrounds, and computer games.

Children's film exemplifies the basic dilemma: Is it – like children's books – an educational media genre or is it an art media genre? On the one hand children's films are often made with a pedagogical or didactical goal. Like educational communication in general they are supposed to support the realisation of a specific educational objective. On the other hand children's films and books have the same function as any other work of art: to make an aesthetic judgment – a judgment of taste, which by definition is highly subjective<sup>24</sup> - socially communicative.<sup>25</sup> The function of art is to make "...perception ("Wahrnehmung") available for communication..."<sup>26</sup> as Luhmann says.

One thing is obvious. That children's film as media genre is placed between two differentiated functional systems in society: Education and art. This is not a question of an "ontological" dilemma. This is not an inherent tension in the children's film as such, and it is also not the case that the film will be of less value if it has a pedagogical objective, or that it becomes of high value or "dangerous" for a child audience, if it has an artistic objective. Rather, the point is that the same phenomenon appears differently depending on the observational position: Is it observed from the point of view of the system of art or of the educational system?

Museums, playgrounds, computer games as well can be observed from different viewpoints. Museums have a scientific function, and they have a life-world function, i.e. to make the past observable. However, they also have an educational function: Museums are educational media.

Something similar can be said about playgrounds. On the one hand children are supposed to develop themselves freely and without any hidden concerns. On the other hand that are also supposed to learn something, e.g. to control their bodies. The same dilemma can be identified with computer games. Like films and books they are aimed at aesthetic realisation, but at the same time they have a pedagogical function: They are supposed to educate. Consequently, all these media can be observed through the optics of media pedagogy, i.e. as educational media. Let me with a final example suggest, what could be said about the playground as educational medium based on this approach and with the above considerations in mind.

First of all the playground incarnates a specific consideration of purpose. Its clear colours, its potentials for free activities, its organic forms etc. – all this is designed from considerations concerning what is beneficial for the bodily activities of children. It incarnates a pedagogical ideal and an educational teleology.

The function of the playground as a dissemination medium, a medium of understanding and an effect medium is subtle. There isn't any explicit or specific message, which must be mediated. Still however it is obvious that a certain teleology is supposed to be realised. The playground is supposed to attract children with its tempting visibility. It is supposed to "translate" a pedagogical message. And it is supposed to have an effect, namely to stimulate children to be cheerful, bodily strong, trustful and expressive. In addition, many modern playgrounds should stimulate collective activities. Yes, playgrounds are strong effect media.



Should playgrounds stimulate reflection? I suppose not. Playgrounds are supposed to stimulate spontaneity. The children are not supposed to be able to observe that they are being observed, for instance by being contextualised into a pedagogical framework. Supposedly, this is due to an evolution theoretical consideration: Reflection occurs later in the child's individual evolution history.

However, it is quite obvious that playgrounds are placed in the spectrum between freedom and necessity, and between virtuality and reality. That they are placed in the spectrum between freedom and necessity can be seen from the fact that playgrounds are designed in the interval between free activity – play – and rule-based activity, game. One can use a climbing frame or a swing for many things, but not for everything.

Basically, however, playgrounds as educational media are placed in the interval between virtuality and reality. They pay tribute to the principle of so-called experience based pedagogy. Life – not even early child life – is uncommitted easiness. It is sounder to be at the playground than to sit in front of the television set, is the implicit message of the playground (and its pedagogical designers). Of course, the playthings and climbing frames must be certificated according to safety regulations. However the basic point is that one hurts oneself, when one fall off the swing.

### **Conclusion**

The intention of the present paper has been to present the overall structure of media pedagogy.

Media pedagogy includes three basic elements: First, it includes a theory of media education, i.e. a theory of the way in which one can teach the pupils and students to use media, and how one can teach them about media as a phenomenon in society. Second, it includes a theory of education within the context of “media-socialisation”, i.e. within the context that mass media represent a special aspect of socialisation in relation to the pupils. Third, it includes a theory of educational media.

This latter part includes the identification and analysis of the following aspects: First, it includes the fact that education represents a particular form of communication that has developed as a result of the functional differentiation of upbringing and teaching. Thus, education is a symbolically generalised medium with its special code, intentionality and application of specialised roles. A theory of educational media must specify this particular form of symbolically generalised medium. Second, it includes the fact that in order to make educational communication at least a bit less improbable, specialised media of dissemination, understanding and effect have emerged. A theory of educational media must specify the particularities of these media forms. Third, it includes the importance of supporting both first order and second order observations in the classroom interaction. Fourth, it includes a specification of three classroom interaction relations: Student-teacher, student-subject and teacher-subject, and it includes a specification of the specific media forms developed for mediating these relations. Fifth, it includes the basic distinctions of hetero-organization/self-organization and of virtuality/reality in educational communication, and it includes analyses of the ways in which educational media can make these distinctions observable.

Of course, a theory of media pedagogy and of educational media includes the forms, applications and usages of digital media for education, and the specific aim of the present paper is to present a framework for a theory of digital educational media. However, I have tried to demonstrate that theories of digital educational media, e.g. e-learning, must be based on a general media pedagogical theory, for instance the theory that has been outlined in this paper.

## Literature

- Baecker, D. (2005). *Kommunikation*. Reclam, Leipzig.
- Dreyfus, H.L. (2001).: *On the Internet*. Routledge, London.
- Foerster, H. von (1984). *Observing Systems*. Intersystem Publications. Seaside, California
- Fritze, Y., Haugsbakk, G. and Nordkvelle, Y. (2004). "Tema: Mediepedagogikk" [Theme: Media Pedagogy], in *Norsk Medietidsskrift*, årg. 11 nr. 3.
- Hjarvard, S. (2005). *Det selskabelige samfund*. Forlaget Samfundslitteratur, Copenhagen.
- Laursen, P. F. (2004). *Den autentiske lærer* [The Authentic Teacher]. Gyldendal, Copenhagen.
- Luhmann, N. (1985). *Die Kunst der Gesellschaft*. Suhrkamp Verlag, Frankfurt a. M.
- Luhmann, N. (2000). *Art as a Social System*. Stanford University Press, Stanford.
- Luhmann, N. (1995). *Social Systems*. Stanford University Press, Stanford, California [first German version 1984].
- Luhmann, N. (2002). *Das Erziehungssystem der Gesellschaft*. Suhrkamp Verlag, Frankfurt a. M.
- Luhmann, N. (2004). "Erziehender Unterricht als Interaktionssystem" [1985]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M.
- Luhmann, N. (2004). "Systeme verstehen Systeme" [1986]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M.
- Luhmann, N. (2004). "Sozialisation und Erziehung" [1987]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M.
- Luhmann, N. (2004). "Das Erziehungssystem und die Systeme seiner Umwelt" [1996]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M.
- Luhmann, N. and Schorr, K. E. (1988). *Reflexionsprobleme in Erziehungssystem*. Suhrkamp Verlag, Frankfurt a. M. [1979].
- Oettingen, A. von (2002). *Undervisningens Paradoks* [The Paradox of Education]. Klim, Copenhagen
- Qvortrup, L. (2004). *Det vidende samfund* [The Knowing Society]. Unge Pædagoger, Copenhagen.
- Qvortrup, L. (in press) "E-Learning – A Knowledge Theoretical Approach", in: Peter Ludes (ed.): *Convergence – Fragmentation: Media Technology and the Information Society*. Changing Media, Changing Europe. Intellect, Bristol and Portland.
- Rasmussen, J (2004). *Undervisning i det refleksiivt moderne* [Teaching in the Reflexive Modern Society]. Hans Reitzel, Copenhagen
- Schön, D. A. (1991). *The Reflective Practitioner*. Ashgate, Aldershot [1983].
- Watzlawick, P., Beavin, J. H. and Jackson, D. D. (1967). *Pragmatics of Human Communication*. New York.

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- 1 cf. Donald A. Schön: *The Reflective Practitioner*. Ashgate, Aldershot 1991 [1983].
  - 2 Cf. Alexander von Oettingen: *Undervisningens Paradoks* [The Paradox of Education]. Klim, Copenhagen 2002.
  - 3 Cf. Yvonne Fritze, Geir Haugsbakk and Yngve Nordkvelle: "Tema: Mediepedagogikk" [Theme: Media Pedagogy], in *Norsk Medietidsskrift* årg. 11 nr. 3, 2004, pp. 206-214.
  - 4 Niklas Luhmann: "Das Erziehungssystem und die Systeme seiner Umwelt" [1996]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M. 2004, p. 241.
  - 5 This concept was introduced by Niklas Luhmann and Karl Eberhard Schorr in 1979, cf. the definition of the concept in Luhmann and Schorr: *Reflexionsprobleme in Erziehungssystem*. Suhrkamp Verlag, Frankfurt a. M. 1988 [1979], pp. 58-62. See also Niklas Luhmann: *Das Erziehungssystem der Gesellschaft*. Suhrkamp Verlag, Frankfurt a. M. 2002, pp. 183-196.
  - 6 Niklas Luhmann: "Erziehender Unterricht als Interaktionssystem" [1985]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M. 2004, p. 15.
  - 7 Ibid.
  - 8 Cf. : *Det vidende samfund* [The Knowing Society]. Unge Pædagoger, Copenhagen 2004.
  - 9 Niklas Luhmann: "Sozialisation und Erziehung" [1987]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M. 2004, pp. 111-122.
  - 10 This position can be found in e.g. Hubert L. Dreyfus: *On the Internet*. Routledge, London 2001. See my critical discussion in Lars Qvortrup: "E-Learning – A Knowledge Theoretical Approach", in: Peter Ludes (ed.): *Convergence – Fragmentation: Media Technology and the Information Society*. Changing Media, Changing Europe. Intellect, Bristol and Portland, in press. In Denmark the same position is articulated in Per Fibæk Laursen: *Den autentiske lærer* [The Authentic Teacher]. Gyldendal, Copenhagen 2004. Within a general media scientific context this position is widespread. Here it builds on a rather narrow definition of media as technical dissemination media. See for instance Stig Hjarvard: *Det selskabelige samfund*. Forlaget Samfundslitteratur, Copenhagen 2005, p. 36, where he analyses the "replacement" of face-to-face communication by "mediated" communication.
  - 11 Cf. Jens Rasmussen: *Undervisning i det refleksiøt moderne* [Teaching in the Reflexive Modern Society]. Hans Reitzel, Copenhagen 2004. p. 11.
  - 12 Niklas Luhmann: "Systeme verstehen Systeme" [1986]. In: Niklas Luhmann: *Schriften zur Pädagogik*. Edited by Dieter Lenzen. Suhrkamp Verlag, Frankfurt a. M. 2004, pp. 48-90.
  - 13 Niklas Luhmann: *Das Erziehungssystem der Gesellschaft*. Suhrkamp Verlag, Frankfurt a. M. 2002.
  - 14 Ibid. p. 22.
  - 15 The classical conceptualisation is that of Heinz von Foerster: *Observing Systems*. Intersystem Publications. Seaside, California 1984.
  - 16 The following is based on Niklas Luhmann: *Social Systems*. Stanford University Press, Stanford, California 1995 [first German version 1984], pp. 157-163.
  - 17 Niklas Luhmann: *Social Systems*, op. cit. p. 143.
  - 18 Cf. Paul Watzlawick, J. H. Beavin and D. D. Jackson: *Pragmatics of Human Communication*. New York 1967.
  - 19 Cf. Niklas Luhmann: *Das Erziehungssystem der Gesellschaft*, op. cit. p. 105.
  - 20 Thanks to Yngve Nordkvelle for mentioning this example.
  - 21 If one compare the English terms "education/teaching material" and "instruction material" it is obvious that the distinction isn't clear between the mediation of the

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student-subject relationship and the student-teacher relationship. It is clearer in Danish: "læremiddel" versus "undervisningsmiddel".

- <sup>22</sup> Thanks to my colleague Bo Kampmann Walther for suggesting this play on words.
- <sup>23</sup> I have got the example from Espen Aarseth at the IT University in Copenhagen.
- <sup>24</sup> Cf. Niklas Luhmann's observation that "...the notion of taste aims at the necessity of a (...) selection without being able to provide a criterion". Niklas Luhmann: *Art as a Social System*. Stanford University Press, Stanford 2000, p. 381 (footnote 86). In Niklas Luhmann: *Die Kunst der Gesellschaft*. Suhrkamp Verlag, Frankfurt a. M. 1985, p. 387.
- <sup>25</sup> Cf. Dirk Baecker: *Kommunikation*. Reclam, Leipzig 2005 p. 17.
- <sup>26</sup> Niklas Luhmann: *Art as a Social System*, op. cit. p. 48. In Niklas Luhmann: *Die Kunst der Gesellschaft*, op. cit. p. 82.