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Media, Marks & Communication Technology: A proposal for a terminology[1]

Key words: Media, marks & technology; modality, effort & motivation; forum-technology & writing.

It is often argued that students derive advantage from collaborating on the Internet, but almost as often realizations of collaboration on the Internet shows poor results (cf. Baker et al. 2003; Olesen 2001; Langager et al. 2004). I will argue that even though there are many platforms for collaborating on the internet, it is often only the technical platform that has been designed, not the educational organization and methods in connection to the platform.

Collaboration on the Internet differs from collaboration face-to-face in that it is written and mediated by the forum technology. By analysing the characteristics of the mode of writing and the forum technology I will show why it demands more effort to collaborate on the Internet than is usually anticipated. To perform this analysis I need a consistent terminology that makes it possible to designate precisely what aspects of the phenomenon of communication I refer to. The analysis leads me to proposing a list of principles for organizing student collaboration on the Internet. The paper thus has a double focus: To present a terminology and to give an example of its practical implications.

I will end the paper with a presentation of an educational platform for collaboration on the Internet, called a web parliament.

In the field of media studies the word – as in everyday language – media is used in a variety of senses often without clear distinctions between very different designations (cf. Bundsgaard 2005: 4.1.3). The word medium is used to designate as different phenomena as institutions (the news media), genre (the advertising medium), technology (ict media, i.e. information and communication technology media!), the physical object or substance where marks are marked (the book page) etc. It would be no problem if the senses were clearly differentiated in use, but they are not.

There can be a number of explanations to this inconsistency, one of them being that the word medium has originally been used when talking about what was in between the persons communicating. This something was in the beginning a piece of clay or paper, marked by a pencil and later on with the help of a printing press. What is in between nowadays is a far more complex matter: It could for instance be a TV screen, marked by the technology in the picture tube, from signals produced and transmitted far away. My conception is that these continuous developments in production technologies and in carrying media have been continuously metaphorized by

[1] The considerations in this article build upon, are a translation of, and extend parts of Bundsgaard forthcoming.

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the term medium. And that as we went along also those phenomena that produced the contents (i.e. the marks that could be read as text) have been metaphorized the same way. This has not been an urgent problem until recently because the technologies, the media and the marks produced in the media was in broad outline closely connected.

Gunther Kress have noticed a similar relation between the modality of writing and the paper medium:

> An entirely reciprocal relation existed between the medium (the book or page) and the mode (writing). The forms of writing structured the appearance of the page, as much as the organisation of the book (Kress 2003: 11(?))

I would characterize this assertion as a bit to categorical, but I think Kress is right in the substance: It has been understandable to expect a clear connection between medium, mode, and technology for the production of marks etc.

This connection is no longer that clear. There is a range of technologies for the production of marks in the same type of medium: For instance marks can be marked on paper by the traditional writing technologies: Pencil handled by a human hand, by the printing press (for instance film and ink), and by computer technologies: the ink jet printer, laser printer, the plotter etc.; and the traditional TV screen can be marked by analogue technologies like the television technology where signals are transmitted and filtered so the picture tube can mark the screen, the video technology where a memory medium (the tape) holds the marks that are transformed by the video machine and sent to the picture tube, and digital technology where a computer compute the signals to send to the picture tube. Almost the same technologies but with other filters and programs can produce marks in a medium similar to the traditional TV screen – for instance the lcd-screen, the plasma screen etc.

The point I am trying to make is that these technologies and media are of great significance for the communication they are mediating. But if we do not have firm terms for the concepts we are discussing we loose sight of what the influence of the technologies, the media etc. (in brief: tools) are on the communication.

For that reason I will propose a firm terminology that can help us analysing the impact of the tools used in communication. After the presentation of these terms, I will present a number of categories to characterize media, technology and modality.

In the second half of the paper I will show how these categories can be used to characterize distinctive features of forum technology, the screen medium and the modality of writing, and how this can be used to formulate principles for collaborating via the Internet.

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Terminology

I have already presented most of my proposal for a terminology. The most important distinction is that between a communication technology and a medium. To underline the specific use of the word medium, I often call it "carrying medium" as opposed to memory medium and medium in the broad everyday sense. My definition sounds

> A **carrying medium** is a physical substance in which **marks** are marked using a **communication technology**.

This means that there is always a medium involved in communication: There are no such thing as unmediated communication. Technology is on the one hand the physical technical objects, i.e. the pencil, the computer (chips, cables, input devices like the keyboard and mouse etc.), and algorithms (for instance computer programs, or traits of moving parts in a typewriter etc.), and on the other it is the *physiological and mental constituents, and the social organisation*: the *competence* of individual persons and groups to handle the physical objects and produce adequate marks; and *organisation* of the technical objects, the persons and the work flow. I.e. technology is **technical objects**, **social organisation**, and **individual and group competence**. Often I and others use the word technology to designate only the technical objects; I will preserve this small inconsistency in order not to complicate language use too much.

The marks that the technology marks on or in the medium can be physical traits, for instance black lead dust or dots of coloured light, or it can be shaped in the medium, for instance scratched in stone or modelled in glass.

As I noted in the beginning sometimes institutions, as well as genres and other categories are called media (the news media, advertising medium etc.). Sometimes it makes good sense in the context, and sometimes it seems the only possible solution to use the word medium for a range of phenomena related to a medium: The news media consists of people cooperating in institutions to produce texts marked as marks sometimes in a number of different carrying media with the use of a range of communication technologies (computers, cameras, transmitters and so on). To use the word medium for all of these phenomena is an easy and intelligible metaphor: All of the phenomenon is in a sense between those who has something to say (the politicians, the companies etc.) and those who wants to watch, read or listen. I will call this kind of use of the word medium a socio-cognitive scheme use; for instance I would talk about the mass media socio-cognitive scheme, the advertising medium socio-cognitive scheme. I then use the word socio-cognitive scheme in this sense: A socio-cognitive scheme is a (number of) man-made object(s) (including social and mental relations) taken as a whole and conceptualised as one phenomenon in daily or academic practise. The concept socio-cognitive scheme is a very preliminary concept, that I have to investigate further.

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In the following I will show how to use characteristics of media, technologies and modalities as analytic tools in the purpose of understanding how specific media, technologies and modalities influence the communication situation; these tools can for instance be used to contribute to answer questions like: Is this technology and this modality suitable for this purpose, what does it come to mean for our mental and social relations to use this technology (in line with Derrida 1970 and Wellman 2001), why did that shift happen in our society when this carrying medium, this technology, and this modality was introduced (in line with Eisenstein 1972 and McLuhan 1969), and so on. I do not want to make the impression that these analytical tools and these terminologies does the whole trick, but it is my experience that these tools together with a theory of learning and motivation will be helpful in analyses where the analyst has trouble understanding for instance why students who is supposed to communicate via the internet or to help each other in their writing, do not collaborate as expected.

In the following I outline a number of terms to describe the properties of media, communication technology, and modality. First I present two terminologies to characterize media properties and communication technology process types (cf. Bundsgaard 2000: 11ff.; Bundsgaard forthcoming: 4.1.3.4.2).

Communication technology/ modality	***Process type***	***Category***
Speech, gestures, facial expressions	0-means production	Bodily
Drawing, writing by hand & pencil	Single means production	Writing
Printing press, typewriter	Dual means production	Mechanical
Telegraph, radio, TV, email, film	Transformed/transported production	Tele
www, elearning, games	Interactive production	Interactive

Figure 1. Categories of communication technologies.

Properties of carrying media	***Categories***
Viscosity	Static, viscose, plastic
Preserving property	Permanent, transient
Portability	Portable, hard to port, non-portable
Availability	Inexpensive-expensive, dangerous/un-dangerous, easy/difficult to produce

Figure 2. Properties of carrying media.

The first communication technology (and a central part of all communication technologies) was the human body. With the body we communicate by gestures, facial expressions, proxemics, sounds and speech etc. All of these modes require no external means to be produced, and therefore I call the production 0-means production (cf. Figure 1). These modes are marked

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either in the body or as sound waves in the air. While the body has a certain degree of viscosity, i.e. the marks can be visible for some time – normally measured in seconds – the marks in the air are gone in the same second they are produced, i.e. the air is more plastic (cf. Figure 2), but none of them has any preserving properties, they are transient.

When our ancestors began to draw and write they developed a new process type, where marks were produced with one means (single means production, the means could for instance be a stick, a stone etc.) that gave them the opportunity to mark media like stone, wood, clay etc. These media were characterised by a more static viscosity, and their preserving properties were high. Some of them were having a low portability – rock walls were un-portable for example, while others were portable and formed the basis for the development of social structures never before seen: The Mesopotamian, Egypt and Inca empires to mention a few (Larsen: 1989; Bundsgaard 2000: 37ff.).

The development of the printing press has a long previous history from the Chinese seals used in the first millennium B.C. and block prints of the ninth century, to movable clay and wooden types developed in China in the eleventh century and movable metal types in Korea in the thirteenth century (Diringer 1982: 410ff.) to the person who is usually – in the western world – named the inventor of the printing press: Gutenberg in the mid-fifteenth century. The technology of the printing press is characterized by the use of dual means: First a matrice is produced (a *memory medium*), and then this matrice is used to produce the marks on the medium. This makes it possible to produce a large number of similar texts on static and permanent media, which together makes the availability of the marked medium high. This led to a row of revolutions in the Western Europe in the centuries following the fifteenth (Eisenstein 1979): The possibility to compare long tables of the exact same observation numbers contributed to the rise of the modern natural sciences, the cheap bibles gave the people access to individualized Christianity, while the scholars began losing faith in the belief that the bible were the words of God etc.

When Samuel Morse introduced his first working telegraph in 1842, he also introduced a new category of communication technologies: The one that transform and transport the message. The telegraph could produce marks in either air as beeps or on paper as dots and strokes. The transformed message can be said to be "remembered" by the technology while transported in wires or as electromagnetic waves in the air; later transforming technologies involve *memory media* that are more preserving like the vinyl record and the magnetic tape. A lot of very different technologies fall into this category, and here it gets very obvious that we must distinguish between the medium and the technology. The same medium can be marked by very different technologies: The lcd screen can be marked among other things by video technology, broadcast technology, and computer technology, making very different communication technologies possible: Home cinema, television, pda, pc, mobile phone etc. These very different technologies leads to very different opportunities of use

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and therefore to very different practises and organisation of social relations in connection to these technologies: Television, radio and other broadcast technologies and computer games (in particular unending online computer games) set the stage for the phenomenon of *flow* which is the solution to the problem of keeping the viewers or players tuned in on the channel or game site. The precondition for flow is that the medium is plastic while it doesn't have to be portable.

The transforming and transporting communication technologies has a row of properties that causes the technologies to have different advantages and disadvantages. A list of relevant properties is presented in Figure 3 (cf. Bundsgaard forthcoming).

Characteristic	***Phases***
Fidelity	Distorted-undistorted
Chronicity	Synchronic, transchronic, asynchronic
Place	Syntopic, transtopic
Reciprocity	Simplex, half duplex, full duplex
Distribution	One-to-one, one-to-many, many-to-many, many-to-one
Bandwidth	High-low
Reliability	Always functions - sometimes functions - never functions
Availability	Can be reached from everywhere - falling out - fixed connection
Latency	Immediate - delayed

Figure 3. Properties of communication technologies.

The transformation of the message to signals and the transport of the signals that is used in marking the medium make it possible to produce marks in media of different sizes and qualities. This means together with the risk of distortion of the signals that the producer of the message cannot be sure what exactly the consumer sees (there could be problems with reliability and fidelity, cf. Figure 3). On the other hand the producer can produce a message that the consumer can consume at the same moment as it is produced, even if he is far away (the chronicity is synchronic). This real time production and consumption plays a powerful part in the development of the so called global village, where local events instantly become greatly important world wide, cf. 9-11, the tsunami in the South-East Asia, the famine in Ethiopia etc.

The last category in Figure 1 is the interactive category. Some computer technologies provide the opportunity for the consumer to participate in the production of the text. In (Bundsgaard forthcoming: 4.1.3.6; my translation) I defined interactivity thus:

> **Interactive production** is when two or more subjects (or institutions) co-produce text. The first producer (S_1) is programming a computer (or coining rules for the consumption in another way) so that a text gives the opportunity for the consumer (the co-producer) (S_2) to write along and make choices that influence the final text.

The interactive communication technology category is a very interesting category in which new technologies constantly come into existence. In the

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following I will try to give a thorough description of one type of interactive communication technology: the forum technology. I define forum technology as a technology that makes people post messages that can be read and related to (answered) so that the technology can show related messages in a row or as hyperlinks. In this context I focus on messages in written mode. When I am using the term text in the following I will refer to marks in the mode of writing.

A forum is a technology with transchronic and transtopic consumption, half duplex, interactive production, many-to-many-distribution, and the possibility of both short and long latency (from almost immediate consumption to almost infinite delay in production and consumption).

A forum is manifested as light marks on computer screens. A screen is characterized by being plastic, able to preserve the marks as long as the technology sends the right signals, and not very portable at the time being (pda's and some mobile phones are able to show forums in a reduced edition) and the media and technology is available for most people in the western world. The contents of forums are marked on different kinds of memory media, most of them making it possible to save the message as long as intended. In the following I will dig deeper into what these characteristics mean for the use of fora in communication.

I use the term latency in a way that differs slightly from the use made in engineering. In engineering it is a measure for how long it takes for a signal to get from phase *a* to phase *b* (for instance when a button is pressed). Latency comes from Latin and means "to lie hidden". It is in this sense I use the word: Latency in this context is the time the message lie hidden until it is actualised. Thus latency is the time from production *a* to the time of consumption *b*.

When a message is posted in a forum it can be read instantly (when the forum is not moderated; the time it takes from a message is posted till it is read depends on a lot of factors: Is there an email-notice when there are new posts or do the forum-participants update their view on a regular basis, are people aware of the existence of the forum etc.). This makes it possible to communicate almost as synchronous as in chat, but less synchronous as in speech face-to-face where an utterance can be interrupted in the moment of production (the reciprocity is half-duplex, i.e. messages are produced in its entirety, and sent, or more precisely registered, one at a time). The close-to-real-time possibility has the consequence that people use forums as support-forums when having troubles with computer related stuff: When asking a question in a well monitored forum, you can expect to get an answer after waiting a few minutes. Chat is a technology that is in some aspects close to forum technology. Chat has a very short latency, optimally no latency, and therefore when chatting people expect to get an answer right away – like in spoken conversations. But it takes time and effort to produce text (cf. below) and therefore chat is mainly a communication technology used for socializing: it consists of short and predominantly emotive and phatic messages (cf. Jakobson 1960).

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In contrast to chat, the forum technology does not require an immediate answer, and this leaves time to think the message over and possibly research and investigate the subject (cf. the considerations on the mode of writing below). The short but not non-existing latency in the written communication in a forum is one of the reasons to fora being suitable for written communication where all the language functions can be dominant. In a question-answer forum, the conative and referential functions is dominant, in a political forum the emotive, the metalinguistic and the referential functions is dominant etc.

Forum technology suggests that messages are given a comment or an answer. When you do not get an answer you must decide how to interpret this silence: Was the question to stupid, to unclear formulated, to hard or to difficult to answer, or do the people attending the forum just not like you? This rather wide variety of possible interpretations of the reasons for silence is caused by the screen medium marked with text (and not for instance images of the participants), unlike face-to-face-communication: Even though a person does not say anything, he communicate with his body: Gestures, proximity and facial expressions. Along these lines the screen medium also makes it easy to leave the forum without ever coming back and without feeling any loss or guilt towards the people left behind in the forum. These observations can be summarized in the following point: *In forums social relations is created solely on a verbal level and does not rest on bodily communication and therefore organisations of fora has to take into consideration if and how social relations should and could be encouraged*.

Forum technology is many-to-many-distribution in a very complex way. Most instances of the forum technology are marking the contents in memory media that gives the contents permanence. This means that people, for instance through use of the full text search machine technology, can get direct access to a message produced at an arbitrary point in time (transchronic consumption). This delay (long latency) makes the question-answer forums an invaluable source of information when programming computers for instance. On the other hand it makes it possible to track down the communication of a person as far back as the person has participated in fora. Most people do not have the access to delete their own messages or whole fora. In principle this should compel everybody to consider every time posting in a forum if the message could be inconvenient later on in life.[2]

[2] The many-to-many-distribution has been the reason for a lot of expectations towards forum technology for introducing real democracy: Now everybody can speak up and everybody can listen (Rheingold 1993: 276). This expectation rest on a row of presuppositions that is hard to satisfy. First: How does everybody find what somebody says, and why should everybody bother about what somebody says; secondly: If the definition of democracy is: Taking the best decision in a common setting on an informed grounding: What is the common setting? How is decisions taken? How is the decisions implemented? Etc. And thirdly: How do the

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The memory media and the interactive technology also make it possible to mark the same content in very different ways. When searching a full text copy of the Internet (for instance google's search database), and clicking through to a forum message, the message can be an answer to another message (and some of that message can be included in the answer as citation) and be part of a larger discussion. This future viewer does in a way read the same text as the original participants, but in another sense it is a completely new message he is reading, maybe leaving him with completely different sense of the contents. The text is produced interactively.

The potentially long latency and the many-to-many-distribution thereby make the forum technology extremely powerful in social life both in a constructive and in a potentially destructive sense.

Modality

A forum is predominantly mediating written messages. In the past years there has been a growing interest in investigating what different modes (or modalities and multimodalities) means for the message (Krees & Van Leeuwen 2001; Kress 2003). As with the concept of medium modality is used and defined in a number of more or less consistent ways. I propose the following definition of the concept of modality (cf. Bundsgaard forthcoming: 4.1.4):

> **Mode** is the rules a text is marked and perceived with respectively. And mode is the features of a text that is dependent on how it is marked and should be perceived.

Writing is in written mode, acoustic signals can for instance be in spoken mode, figurative sound mode (for instance the designed sound of a car door, the sound of the buttons on a stereo) or musical mode. Most theoreticians on mode call image a mode (for instance Kress 2003: 19f.), but I will argue that image is to broad a category to be called a mode. A drawing and a picture (that depict something) are in figurative mode; an icon is in iconic mode, moving pictures are in cinematic or animated mode etc.

To get a base for comparison of the particular features of the written mode I will begin with a short analysis of the features of spoken mode.

Modality of speech

Spoken texts are marked as sound in the air. The air is a very plastic medium and therefore the listener cannot look back or return to an earlier place in the spoken text (unless the sound is transformed and marked on a memory medium, see below). Therefore the limit of what can be surveyed is the short-term memory and the speed of understanding. Sound has to be consumed in the pace which it has been produced with, and thus one

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participants find the time and effort to write the utterances in the discussion (cf. my considerations on the mode of writing in the following).

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cannot stop and reflect upon the text listened to without missing the following part. One must listen, hear, think, understand, reflect upon and take a position on the contents at the same time. When producer and consumer is present at the same time the consumer can answer the producer through speech as well as other modalities (proxemics, facial expressions, gestures etc.) and thereby to a certain degree control the pace and contents of what is said.

Sound can be transformed and the transformed signals then marked on memory media. This makes it possible to wind, stop and with some technologies to jump in the message. But in contrast to writing that is marked on paper or on other more or less static media (with a technology that makes one decide the pace in which the marks is replaced with new, i.e. not the TV technology), where that kind of activities only require one to change the movement of the eyes, reorientation in relation to sound recording and reproducing technologies requires one not only to stop listening, but also to stop and reorientate the technology. One cannot on recording technologies (but to a certain extent on speech synthesis technologies) ask for "the previous three sentences", one must wind more or less at random. So because of the plasticity of the air medium, the reading of spoken text is not as "plastic" as reading of writing marked in a static medium.

We learn to speak as children, and it is such an integrated part of our thinking and communicative competence that we barely notice that it requires energy to produce and consume spoken marks. Because speech prototypically is produced on the fly while consumed, there is a manifest acceptance of that speech consists of repetitions and self corrections, half and full sentences, interjections, a high degree of taking stance, etc.

These analyses has been done according to this method:

1. Investigate the characteristics of the prototypical **medium** of the modality under inspection
2. Investigate the characteristics of the prototypical **technologies** producing texts of the modality
3. Investigate the typical **cultural expectations** to texts of the modality
4. Investigate how prototypical **communication situations** are organized because of the modality

Figure 4. Analysis of modality.

In the following I will compare this analysis with an analysis of the mode of writing.

Modality of writing
Writing is marked on paper or on other more or less static media (for instance the computer screen). I will focus on the instances where the transformed signals are marked on a computer memory medium.

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The consumer can:

1. **skim through** the text,
2. mechanically **search it**,
3. **jump** in it,
4. read it in **his own pace**, and
5. return and **read it over again**.

And furthermore in the production process, the producer:

1. can **read what he has written so far** and **be inspired** for the following text,
2. can return in the text and **change** it
3. can **change the sequence of the text**, and
4. **has the text to himself** until he considers it done and hand it over for reading.

Figure 5. Features of a written text.

The time-consuming production of writing most frequently make people talk if they are in the same room. This means that the communication situation of written communication often involves people that are not in the same room. This again means that:

1. The text must be **produced as a coherent whole** and not in a continuing dialogue,
2. it is not possible to point to the context with the body, so **pointing to the context** must be done by textual cues (deixis) and explanations,
3. the producer is likely not to know the exact knowledge and background of the consumers, so he must **set out more explicitly what he intends to express**,
4. the producer only has a **limited knowledge** of what the consumer think of what the producer utter, and therefore does not know precisely **what the consumer concieve of the utterance** (get insulted, sorry about, tired of etc.).

Figure 6. Consequences of the mode of writing (when not in the same room at the same time).

This makes me propose the following characteristica of cultural expectations towards a text caused by the mode of writing:

A text is most often not handed over before it is

1. **explicit**,
2. **unfolded**,
3. **one-dimensional**,
4. **well-structured**, and
5. **finished**.

Figure 7. Cultural expectations towards a text.

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I imagine these characteristics to be caused both by more material features of the mode, by more material features of the media and technologies related to the mode, and by the expectations developed culturally over time in relation to the actual use of writing. I would imagine that these characteristica will turn out to be less demanding to keep pace with the way that we communicate by email, blog, chat, messengers etc. But they will not disappear.

That the text is **explicit** means that one tries to ensure that the things one mention is known by or introduced to the consumer. In a synchronous and syntopic (i.e. produced at the same place as it is consumed) produced and consumed writing or speaking it is possible to try out an implied and sympathetic utterance and immediately see or hear if it was too implied. That the text is **unfolded** is closely connected to the explicitness, but it accentuate that one expects a written text to be more thorough than a spoken utterance.

The **one-dimensionality** of written text means that the producer is expected to keep to the point and to one line of argumentation. I presume it is connected to the linear structure of writing (cf. Bundsgaard 2000: 45ff.; Vygotsky 2000: 180ff.), but I cannot say if it is a cultural phenomenon or if it is materially caused. I leave the discussion.

That writing causes text to be **well-structured** means that it observes the conventionalised rules of structure, for instance: a narrative has a beginning, a middle and an end. This characteristic is of course developed in tradition, but it is also connected to the fact that one can go back in the text and change it.

Finally it is expected that the text is **finished** before it is handed over to the consumer; once more because it is possible to keep the text until it is finished.

These characteristics are of course relative to the genre and situation. A reader's letter shall be explicit by referring sufficiently to the case so the "ordinary" reader knows what it is all about. A scientific article shall be explicit for instance by defining the terms used etc. So the characteristica shall be understood in relation to a text uttered in a corresponding spoken genre.

I thus argue that producing texts is a complex matter: It requires the producer to keep hold of a lot of different perspectives. In order to change the structure of the text, one must be able to survey the text as a whole and as a structure; in order to be explicit, one must be able to imagine what an actual or a typical consumer know and can understand. To organize and finish the text one must know for instance what one think of the subject. In that sense one needs to be finished with the content before one can finish the text. Researchers in the cognitive dimensions of writing have shown how a vide variety of resources has to be employed when writing (cf. Bundsgaard forthcoming: 5.3.2.2.), and already in the nineteen thirties Lev

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Vygotsky analysed the challenges of writing with an outcome similar to mine:

> In learning to write, the child must disengage himself from the sensory aspect of speech and replace words by images of words [...] it is the abstract quality of written language that is the main stumbling block [...]. Writing is also speech without an interlocutor, addressed to an absent or an imaginary person or to no one in particular – a situation new and strange to the child. Written speech is monologous [...]. Thus writing requires a double abstraction: abstraction from the sound of speech and abstraction from the interlocutor (Vygotsky 2000: 181).
>
> Inner speech is almost entirely predicative because of the situation, the subject of thought, is always known to the thinker. Written speech, on the contrary must explain the situation fully in order to be intelligible (Vygotsky 2000: 182).

Principles for the organisation of teaching situations

In Bundsgaard forthcoming I have developed a series of principles for the organisation of teaching situations; these principles are founded on a theory of motivation (Ford 1992), on theories on life narratives (Polkinghorne 1988; Bruner 1996), and on a theory of learning (Vygotsky 2000; 1978; Wood, Bruner & Ross 1976; Engeström 1986).

Ford claims that motivation has to do with three factors in our practise. It is our practise of setting goals (*Directive Cognitive Processes*), of forming ideas of the adequacy of our agency in relation to the tasks at hand, and ideas of what others (the environment) think of the adequacy of our agency (*Personal Agency Belief*, abbreviated PAB), and finally it is the *Emotional Arousal Processes* because they are anticipating and can put us in a state of readiness for action. Ford expresses the claim in this formula: **Motivation = Goals x Emotions x Personal Agency Beliefs**. Ford underline that this is not a mathematical formula, but a formula that shows that there is a complex relation between the factors and that the non-existence of one of them may destroy motivation completely.

Polkinghorne argues that

> Thus, being human is more a type of meaning-generating activity than a kind of object. It is an incarnated or embodied making of meaning – that is, it is primarily an expressive form of being. Narrative is one of the forms of expressiveness through which life events are conjoined into coherent, meaningful, unified themes (Polkinghorne 1988: 126).

Bruner is using this insight to argue that the competence in building and understanding narratives is crucial for our ability to construct our life and place to ourselves in the world.

Vygotsky coined the term Zone of Proximal Development (Vygotsky 1978: 86). In 1976 Wood, Bruner & Ross elaborated this term into the pedagogical strategy of scaffolding, a strategy Engeström later criticized of not doing justice to the phenomenon of the zone of proximal development; Engeström's critique conclude with a reformulation of the Zone of Proximal

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Development and a consequence for the pedagogical strategy of this reformulation, saying that only the teaching and learning situations that aim at developing the historically new forms of activity and not only to acquire the socially existing or dominating as something individually new is in the Zone of Proximal Development (Engeström 1986). I argue in Bundsgaard forthcoming that this reformulation is partly in disagreement with Vygotsky's definition, but that it can contribute to word a more extended and critical version of the strategy of scaffolding.

These insights lead me in Bundsgaard forthcoming to formulate the principles for the organisation of the teaching situation in Figure 8.

Teaching should as far as possible

1. be functional
2. not be "as if"
3. be organized in relation to goals
4. involve and accept personal relations
5. give the students the opportunity to develop and put their personal narrative in play
6. be arranged so as the students has the opportunity to be in their zone of proximal development, and
7. aim at students both acquiring the culturally given, creating new understandings and comprehensions themselves, and is given the opportunity to participate in the development in new forms of activity.

Figure 8. Principles for the organization of the teaching situation.

These principles and the analysis of the screen medium, the forum technology and the mode of writing lead me to the formulation of the following principles for the organization of collaboration via the Internet (Figure 9). The principles are developed in relation to teaching situations, but it is my belief that they also apply in the organization of fora in other settings.

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1. There has to be motivational factors that bear comparison with the effort, i.e.
    a. the environment has to be responsive; i.e. the participants must expect to be taken seriously, be listened to, and answered in good faith,
    b. the participants must consider the goals to be essential and relevant, and
    c. the participants must experience that the social relations is making sense (and cause coveted feelings).
2. The organization of forum dialogues must take into consideration
    a. how participants feel a responsibility towards community,
    b. how they are taking the opportunities, and employ the uncertainty for the sake of developing the social network, and finally
    c. how participants experience getting an identity in the forum
3. The participants must be prepared for the dialogue by
    a. Knowing something (and meaning something)
    b. Being able to express an unfolded argument – or writing must be organized so that it is acceptable that it is not unfolded.

Figure 9. Principles for the organization of collaboration via the Internet

Web Parliament

In the following I will present an organization that honours the above principles. I call the organization a web parliament. I have been participating in the organization of two actual instances of such organizations, both of which I will call successes (cf. Bundsgaard forthcoming: 5.3.2.5).

A web parliament has 4 components:

- **A social room** with student's introductions of themselves and communication in guest books.
- **A publication room** where the students can publish the products they are preparing during the course
- **A web hearing room** where the students can debate the subject of the web parliament
- And finally a **tuition room** with interactive instructional guides in relation to the academic aspects of the practical and subject matter problems the students encounter (interactive assistants, cf. Bundsgaard forthcoming: 5.3.3).

In the parliament we called the *Web parliament of the six graders*, where the students discussed animal welfare, we first established the students social room with a view to introducing them to the technical aspects of the CMS[3] we were using. But the social room showed up to be the pivotal point of the *Web parliament of the six graders*; when the students were waiting for others to answer or got tired of working on the subject they would ask: "Are we allowed to write in the guest books". This social room gave the

[3] Content Management System. Computer software for doing home pages with the browser.

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students a sense of identity and of belonging in a community and a sense of meaningfulness of the school project they were participating in – and ultimately it made it meaningful for them to participate in discussions with what first seemed total strangers.

In the principles for organization of collaboration via the Internet I stated that to participate you have to be prepared for the discussion. This principle is caused amongst other things by the feature of the mode and technology that the text has to be finished before being sent on to the consumer, this meaning that you have to finish and produce an unfolded and explicit text about something that you are not sure of; it is not as common and convenient as with speech to lay out with an attempt to formulate a stance, waiting to go on until you have seen the reaction, and given your interlocutor the option to comment. Therefore the students in the *Web parliament of the six graders* were prepared by reading some arguments that were formulated by their teachers, and by using these arguments as stepping-stones to search the Internet for arguments in the discussion. The students were assigned a standpoint in the discussion, either for or against, which was ensuring dynamics in the discussion. The students were then asked to formulate an argument in favour of their position in the discussion and publicising it in the publication room.

A web hearing is an organization where

- the participants have acquired knowledge and taken a stance on the subject matter
- there is a clearly stated objective and goal of the discussion
- there is a moderator who gives a summary of the discussion, word the disagreements, and point out perspectives that has not yet been touched on, and finally
- there is a time schedule and a meaningful concluding debate or a similar meaningful conclusion of the discussion.

In the *Web parliament of the sixth graders* the concluding debate were organized as a panel debate which in itself made it a conclusion they looked forward to, having the opportunity to meet each other for the first time face-to-face; but in addition the concluding debate was also the opportunity of the students to table a motion before their class mates and the students from the other classes – and not least in front of two politicians from the real political life. This multiple goal: Social and in relation to the subject matter, made it obvious for the students that they had to do a good job in their working with the parliament.

The moderator plays a significant role in the discussion. In the web parliaments I have participated in organising, we have had the teachers function as moderators, but some students might be capable of doing it too – and might acquire a good deal of social and academic competences doing it. The moderator shall take care to mention all the viewpoints represented and all the persons participating in the discussion, giving the participants that are not answered in the discussion a sense of being noticed and of being a part of the social community (cf. my deliberations on silence in

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forums (p. 8)). The other central role of the moderator is to keep the discussion going – by pointing out the structure of the discussion, developing a well-structured edition of the discussion, and by showing and preparing the way to the finish; i.e. in a way writing the multi-dimensional interactive text of the students down to a one-dimensional, well-structured and finished text. The contribution of the moderator then is a starting point of the student's further discussion.

In the tuition room there is a row of interactive assistants ready for leading the students through processes of academic relevance, for instance on how to prepare and make an interview, how to come up with ideas, how to write an argumentative text etc. I will not go further into this matter here, but refer to Bundsgaard forthcoming: 5.3.3).

Most of the students in the *Web parliament of the sixth graders* participated in the parliament with great commitment, ending up formulating together via the web a final statement to be delivered at the panel debate. They had their quarrels and unconstructive disagreements but they were also able to solve some of their problems through metacommunication about the discussions.

Conclusion

In this paper I have presented a terminology in relation to media, technology and modality, and shown how this terminology can be used to characterize concrete instances of communication organizations and to organize situations where the features of the media, technology, and modality is taken into consideration. Let me conclude by underlining that the analytical tools presented cannot stand for themselves when organizing for instance a teaching situation, but must be integrated with theories of learning, motivation, and social relations.

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