Learning beyond Cognition

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Learning by collaborating on the Internet

Jeppe Bundsgaard

This study discusses the importance of considering motivational and not only cognitive factors when organizing collaborative learning on the Internet. The argument is based on thorough analysis of the characteristics of the modality of writing and forum technology. A study which shows that writing demands greater efforts of the writer than does speech, and that with forum technology social relations are created solely on the verbal level and therefore has to be encouraged by the students' entourage and promoted in the organization of the collaboration.

To promote learning is not just a question of preparing the cognitive subject matter, but also of organizing a motivating learning environment that incorporate and appreciate social relations so that the students experience benefits that counter-balance the greater efforts of writing and relating in virtual forums.These deliberations lead to formulation of a number of principles for the organization of collaboration via the Internet. The chapter concludes with a presentation of an organisation called Web Parliament that honours the principles laid out.[1]

1. The considerations in this chapter build upon, are a translation of, and extend parts of Bundsgaard 2005.

It is often argued that students derive advantage from collaborating on the Internet, but almost as often realizations of collaboration on the Internet show 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 with the platform.

Collaboration on the Internet differs from collaboration face-to-face in that it is written and mediated by forum technology. By analysing the characteristics of the mode of writing and forum technology I will show why it demands more effort to collaborate on the Internet than usually anticipated.

When designing collaboration platforms it is necessary to take into account the special properties of written and semi-synchronous communication, i.e. that the participants does not see each other, does not necessarily have any interest in each other *per se*, and has to make greater effort to formulate utterances than if they would have an oral conversation. My analysis of written communication via forum technology shows among other things that it is appropriate to integrate the creation of social relations into the design of a collaboration platform, and that firm organisation of the participants' work is desirable. That is to say it is important to go beyond cognition when thinking about and organizing learning situations.

I will end the chapter with a presentation of an educational platform for collaboration on the Internet called a Web Parliament.

Terminology

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

There can be a number of explanations for this inconsistency, one of them being that the word medium was originally used in reference to what was in between the persons communicating. This 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 may, 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 the term medium. Moreover, the phenomena that produced the contents (i.e. the marks that could be read as text) have also 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 were generally closely connected.

Gunther Kress has 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: 19).

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

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 made on paper using traditional writing technologies: by the human hand (for instance, a pencil) or 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 analog technologies like television technology, where signals are transmitted and filtered so the picture tube can mark the screen, 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 computes 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. However, if we do not have clearly defined terms for the concepts we are discussing we lose sight of what the influence of the technologies, the media etc. (i.e. the tools) are on the communication.

My proposal for terminology has in outline been presented above. The most important distinction is the one between a communication technology and a medium. To underline the specific use of the word medium, I often call it a "carrying medium" as opposed to a *memory medium* and a medium in the broad everyday sense. My definition is:

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

This means that there is always a medium involved in communication: There is 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.), while on the other hand, it is the *physiological and mental constituents, and the social organization*: the *competence* of individual persons and groups to handle the physical objects and produce adequate marks; and *organization* of the technical objects, the persons and the work flow. In other words, technology is **technical objects**, **social organization**, and **individual and group competence**. Often I and others use the word technology to designate the technical objects only; I will preserve this small inconsistency in order not to complicate language use too much.

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

Forum Technology

In my Ph.D.-thesis (Bundsgaard, 2005: 4.1.3) I have presented a number of terms and categories to describe the peculiarities of media and technologies. I will use these in the following, where I will try to give a thorough description of a type of interactive communication technology: forum technology. I define forum technology as a technology that allows people to 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 use 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[2] (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 (PDAs and some mobile phones are able to show forums in a reduced edition). The media and technology are available to 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 forums in communication.

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 postings or do the forum participants update their views on a regular basis? Are people aware of the existence of the forum? Etc.). This makes it possible to communicate almost as synchronously as in chat, but less synchronously than in face-to-face talk, where an utterance can be interrupted at the moment of production (the reciprocity is half-duplex, i.e. messages are produced in their entirety, and sent, or more precisely registered, one at a time). The close-to-real-time possibility has the consequence that people use forums for support when they encounter computer related problems: when people ask a question in a well monitored forum, they can expect to get an answer within 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, as they do 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).

2. I use the term latency in a way that differs slightly from the use made in engineering. In engineering it is a measure of 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 lies hidden until it is actualized. Thus, latency is the time from production *a* to consumption *b*.

In contrast to chat, forum technology does not require an immediate answer, and this gives participants 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 nevertheless existent latency in the written communication in a forum is one of the reasons that forums are suitable for written communication where all the language functions can be dominant. In a question-answer forum, the conative and referential functions are dominant, in a political forum the emotive, the metalinguistic and the referential functions are 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 too stupid, too unclearly formulated, too hard or too difficult to answer, or do the people attending the forum simply 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. In this case, even though a person does not say anything, he communicates with his body through 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 are created solely on a verbal level, rather than through bodily communication, and therefore, the organization of forums has to take into consideration whether and how social relations should and could be encouraged*.

Forum technology involves many-to-many-distribution in a very complex way. Most instances of forum technology mark the contents in memory media that give 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. Moreover, it makes it possible to track down the communication of a person as far back as the person has participated in a forum. Most people do not have the access to delete their own messages or whole forums. In principle, this should compel everybody to

consider every time they post a message in a forum whether the message could be inconvenient later on in life.[3]

The memory media and the interactive technology also make it possible to mark the same content in very different ways. When a search is made of a full text copy of the Internet (for instance Google's search database), and a forum message is clicked through to, it may be discovered that the message is 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 way it is a completely new message he is reading, which may leave him with a completely different sense of the contents. The text is produced interactively.

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

Modality

A forum predominantly mediates written messages. In recent years there has been a growing interest in investigating what different modes (or modalities and multimodalities) mean for the message (Krees & Van Leeuwen, 2001; Kress, 2003; Carlsson et al, 2005). 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, 2005: 4.1.4):

> **Mode** is the rules by which a text is marked and perceived respectively. Mode is also the features of a text that are dependent on how it is marked and should be perceived.

3. The many-to-many-distribution has given rise to expectations that forum technology will introduce real democracy: now, everybody can speak up and everybody can listen (Rheingold 1993: 276). This expectation rests on a number of presuppositions that are hard to satisfy. First, how does everybody find what somebody says, and why should everybody bother about what somebody says; second, if the definition of democracy is making the best decision in a common setting on an informed grounding, what is the common setting? How are decisions made? How are the decisions implemented? Etc. And third, how do the participants find the time and make the effort to write the utterances in the discussion (cf. my considerations on the mode of writing in the following).

Writing is in written mode, whereas acoustic signals, for instance, can 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 too 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 make a basis 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 at the pace it has been produced with, and thus one 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 the producer and the consumer are 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 can then be 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, which is marked on paper or on other more or less static media (with a technology that makes one decide the pace at which old marks are replaced by new, i.e. not 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. Using recording technologies one cannot (as is to a certain extent the case of speech synthesis technologies) ask for "the previous three sentences"; instead, 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 being consumed, there is a manifest acceptance of the notion that speech consists of repetitions and self-corrections, half and full sentences, interjections, a high degree of taking stance, etc.

These analyses have been done according to the following 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 1. *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.

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**.

Furthermore, in the production process, the producer:

1. can **read what he has written so far** and **become inspired** to produce 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 hands it over to others for reading.

Figure 2. *Features of a written text.*

The time-consuming production of writing most frequently makes 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 in turn 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 thinks of what the producer utters, and therefore does not know precisely **how the consumer reacts to the utterance** (whether she, for example, gets insulted, upset, bored etc.).

Figure 3. *Consequences of the mode of writing (when not in the same room at the same time).*

This brings me to propose the following characteristics of cultural expectations towards a text created in 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 4. *Cultural expectations towards a text.*

I imagine these characteristics to be the results of the more material features of the mode, the more material features of the media and technologies related to the mode, and the expectations developed culturally over time in relation to the actual use of writing. I would imagine that fewer demands will be made to live up to expectations in terms of these characteristics the more we communicate through email, blog, chat, messengers etc. They will not, however, disappear.

The fact that the text is **explicit** means that one tries to ensure that the things one mentions are known by or introduced to the consumer. In synchronously and syntopically produced and consumed writing or speaking (i.e. writing or speaking produced at the same time and place as it is consumed) 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 accentuates 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 whether it is a cultural phenomenon or if it is materially caused. I will not pursue the discussion further here.

That writing causes text to be **well structured** means that it observes the conventionalized 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 must be made explicit with sufficient references to the case in question so the "ordinary" reader knows what it is all about. A scientific article must be made explicit, for instance, through definitions of the terms used etc. So the characteristics should 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 track 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 knows and can understand. To organize and finish the text one must know, for instance, what one thinks 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 must be employed when writing (cf. Bundsgaard, 2005: 5.3.2.2.), and already in the 1930s Lev 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 organization of teaching situations

In Bundsgaard 2005 I have developed a series of principles for the organization 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). This approach supports the insight that in theorizing learning one also has to move beyond the cognitive field of science.

Ford claims that motivation has to do with three factors in our practice: our practice 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 Beliefs*, abbreviated PAB), and finally, of *Emotional Arousal Processes*, which involve anticipation 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, 1992: 78). Ford underlines 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 uses 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). Wood, Bruner & Ross (1976) elaborated this term into the pedagogical strategy of scaffolding.

These insights lead me in Bundsgaard (2005) to formulate the principles for the organization of the teaching situation[4] in Figure 5.

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 into play, and
6. be arranged in such a way that the students have the opportunity to be in their zone of proximal development

Figure 5. *Principles for the organization of the teaching situation.*

These principles and the analysis of the screen medium, 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 6). The principles are

4. In Bundsgaard 2005 there is a point 7 based on Engeströms critique of Bruner et al. But after a closer look I have removed this point (cf. my presentation at the defence of the thesis: http://www.did2.bundsgaard.net/forsvar/manus/).

developed in relation to teaching situations, but it is my belief that they also apply in the organization of forums in other settings.

1. There must 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 make sense (and inspire positive feelings).
1. The organization of forum dialogues must take into consideration
   a. in what ways participants feel a responsibility towards community,
   b. how they take opportunities and adapt to uncertainty for the sake of developing the social network, and finally,
   c. how participants experience gaining an identity in the forum
1. The participants must be prepared for the dialogue by
   a. knowing something (and meaning something), and
   b. being able to express an unfolded argument – unless the writing is organized in such a way that it is acceptable that it is not unfolded.

Figure 6. *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, 2005: 5.3.2.5).

A web parliament has four components:

- **A social room** with student's presentations 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 2005: 5.3.3).

In the parliament that we called the *Web Parliament of the Sixth 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[5] we were using. But the social room turned out to be the pivotal point of the *Web Parliament of the Sixth 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 students a sense of identity and of belonging to a community as well as 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 people who at first seemed to be total strangers.

In the principles for the organization of collaboration via the Internet I stated that to participate you have to be prepared for the discussion. This principle is based amongst other things on the fact that the modality of writing and forum technology require that the text has to be finished before being sent on to the consumer. This in turn means 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 it is in speech to make an attempt to formulate a stance, wait to go on until you have seen the reaction, and give your interlocutor the option to comment. Therefore, the students in the *Web Parliament of the Sixth Graders* were given practice in 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 in order to ensure a dynamic discussion. The students were then asked to formulate an argument in favour of their position in the discussion and to publicize it in the publication room.

5. Content Management System. Computer software for doing home pages with the browser.

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 in the discussion
- there is a moderator who gives a summary of the discussion, formulates the disagreements, and points out perspectives that have 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 was 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 the concluding debate also gave the students the opportunity to table a motion before their classmates and the students from the other classes – and not least in front of two politicians from 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 the parliament.

The moderator plays a significant role in the discussion. In the web parliaments the teachers have functioned as moderators, but some students might be capable of doing it, too, and might also acquire a number of social and academic competences doing it. The moderator should 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 forums (p. 4)). 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 as a one-dimensional, well structured and finished text. The contribution of the moderator is thus a starting point of the students' further discussion.

In the tuition room there are a number of interactive assistants ready to lead the students through processes of academic relevance, helping them learn, for instance, 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 2005: 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

I have argued that it is necessary to analyse and understand the implications of using different media, technologies and modalities.

When organizing a platform for collaboration one has to go beyond cognition and take into account the peculiarity of the modality of writing and forum technology. I argue that writing is a task requiring great effort because a text is expected to be explicit, unfolded, one-dimensional, well structured and finished. Forum technology makes it possible to communicate semi synchronous in writing, making the participants able to discuss political and practical problems and to develop their views and standpoints in common. With forum technology the writer expects an answer to his postings, and is left in confusion of the grounds if no answer is given: forum technology is monomodal (writing) while conversation face-to-face is multimodal (including for instance oral, gestural and facial expressions). Therefore with forum technology it is sensible to take into account how social relations are expected to arise from the communication and how conflicts are to be handled.

To promote learning is not just a question of preparing the cognitive subject matter, but also of organizing the learning environment so that the student experiences that the benefit in terms of inspiring social relations and further outcome of solving the task are worth the effort.

The *Web Parliament of the Sixth Graders* showed that social relations are a valuable motivation factor, which promotes the subject learning. It also showed that firm organization of the working processes is likely to lead to qualified outcome.

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