

Texts That Talk Back - Asynchronous Conferencing: A Possible Form of Academic Discourse?

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1. Introduction

A couple of years ago the Center of Distance Education at Carl von Ossietzky University Oldenburg was visited by Prof. U. Oevermann¹, a renowned sociologist, with whom we discussed the issue of asynchronous communication. The discussion became controversial when the visitor declared that 'you should use the Internet for what it can do well: the storage of large databases, their quick processing, and the exchange of information'. He warned against using the Internet for communication. 'What you get when trying to communicate over the Internet is not real communication. It is at best a simulation of communication.' Obviously this position would drive horses through our undertaking to conduct a postgraduate degree program exclusively online.

The professor pointed out that academic communication rested on two pillars:

- (1) the sharp (critical, if necessary, controversial) debate, and
- (2) the academic publication.

Given that asynchronous conferencing shares with (1) the interactivity and with (2) the text-based character, the exclusion of asynchronous conferencing as a viable form of academic discourse seems questionable.

1.1. Writing

Asynchronous conferencing is essentially a text-based mode of communication. As such it applies the intellectual tool of writing. Writing has become a pervasive feature of our everyday life to an extent that its formatting influence has long since become invisible. This is reflected in Aristotle's analysis who regarded writing as the 'translation of speech'. Olson, in his wonderful book *The World on Paper*, quotes Aristotle stating that "Written words are the signs of words spoken" (Aristotle, cf. Olson, 1994, p. 65). As Olson points out, even then this was a view from hindsight: The ability to see words as a sequence of phonetic units is already predicated on the possession of the alphabet. Rather than being a transcription of speech writing provides a model for speech (ibid. p. 8). Olson comments further on the role of writing as facilitating reflection and, indeed in epistemology:

What the Greeks invented was not argument but the ideas about argument, not so much knowledge as an epistemology involving a set of categories or concepts for representing forms of argument - the concepts logic, proof, research, and magic.... They allow these things to become objects of further discourse: What is proof? What is research? What is magic? What is knowledge? (ibid., p. 51).

¹ I refer to Prof. Oevermann in order to acknowledge of the maieutic effect the controversy had for this paper. I am however not sure if my short description does justice to his position.

The role of writing as a formative intellectual tool has been investigated by a number of researchers including Goody (1977, 1981, 1986), Coulmas (1985, 1992), Ong (1982), Assmann (1992) and others. Goody regards writing as the fault line of the 'great divide' between literate and preliterate societies. (This concept is now being borrowed to warn against the next great 'cyberspace divide' (Loader, 1998).) The process of learning to write can be considered 'language analysis', which facilitates the appropriation of intellectual tools like formal logical reasoning and reflection. On the social level writing liberates collective memory and expedites innovation.

This may suffice to substantiate the point that text is an important mode of academic communication. Online conferencing is essentially text based. Unlike speech it is non-transient and it is available for inspection (Kozma, 1991). Asynchronous conferencing shares this important feature with academic publication, one of the main forms of academic discourse.

1.2. Discussing

One of the earliest documents discussing intellectual tools is Plato's examination of writing in *Phaidros* (Schöttker, 1999). This dialogue can possibly be regarded as the earliest example of media analysis and has been referred to by writers like Ong (1982). Plato wrote in a time, which still had clear memories of a preliterate culture. Plato argues that text (writing) is inferior to discussion. Text could be misinterpreted once separated from the author. Moreover, text does not strengthen memory, rather it allows you to do with a weaker memory.

Plato emphasizes the importance of discussion. However, not only did he publish his attack on the written word as text, but also, if it is true what we suggested above, discussion itself is predicated on the formative influence of writing. The Socrates, who teases out contradictions and applies the formal syllogistic reasoning, himself reflects to which extent writing had already become 'a model of speech' (Olson, 1994). Plato's Socrates is decidedly a figure of a literate culture.

One of Plato's main complaints is the lack of interactivity of written documents: He compares them to products of art. Paintings (portraits) look so real and full of life that they invite you to speak to them. But then they keep silent in all their majesty. Writing produces the same irritation: The words seem to address you as if they would possess reason, but if you address questions to the text it remains silent (Schöttker, 1999). It is worth quoting the paragraph in some detail. It is Socrates speaking to Phaidros:

Look Phaidros, the annoying thing about writing is something it has in common with painting. A good portrait presents a person as if living. So does a written text. You could think it speaks to you with some reason. However, if you ask something, because you want to understand, the text repeats itself, always saying the same thing. Once written, the text roves around with anybody and cannot distinguish those to whom it should speak and to whom not. And if mistreated and unreasonably criticized, it always would need the help of its father (author). Without him it is defenseless. (p. 35, my translation).

Not so in asynchronous conferencing: The text is not defenseless. If Plato bases the superiority of the oral communication on the fact that the author of the message can explain what is meant, observe if the other (the interlocutor) understands, and modify

the argument in the light of the understanding of the other, what would he have made of asynchronous conferencing? Asynchronous conferencing implies interactivity, which maintains a lifeline between the text and its author.²

2. Distance Education

Before we move to the analysis of asynchronous conferences it helps to embed this analysis into the context of distance education. Distance education emerged, for a variety of reasons, in the 19th century as correspondence teaching. It is defined as a mode of teaching and learning where teacher and learner are separated for most of the time³. The separation of teacher and learner must therefore be bridged by a medium through which the teacher can present the teaching content and the learner can ask questions.

Hence the role of media in distance education is central. Often little difference is made between educational media and educational technologies. Kozma (1991) defines a medium "... by its technology, symbol systems, and processing capabilities" and refers to 'technology' as "... the mechanical and electronic aspects that determine its [the medium's] function and, to some extent, its shape and other physical features." (p. 180)⁴. The important point is that media are tools. In Kozma's words: "However, the primary effect of a medium's technology is to enable and constrain its other two capabilities: the symbol system it can employ and the processes that can be performed with it." (p. 181).

For early distance education the principal medium was print (i.e. a text medium). Since in early distance education communication between teacher and learner was only possible through correspondence, the standard process of teaching needed to change. Classroom teaching or academic seminars allowed an interlacing of short periods of presentation and dialogue. This kind of 'guided didactic conversation' (Holmberg, 1989) was not possible in the same manner in correspondence teaching because of the time delay between question and answer. This circumstance had far reaching consequences for the development of the specific instructional design, which is typical for distance education, since it meant two things:

1. a strict separation of presentation and dialogue;
2. an emphasis on presentation, and de-emphasis on dialogue.

This shift implied a reduction in interactivity. It needs to be noted that, because of the high premium put on interactivity in pedagogy, this has always been regarded as problematic and identified as the birth handicap of distance education.

But as it is often the case: Limitations may be compensated by enhancements. In distance education the need to rely on the text to communicate the educational message and few options for the learner to come back with questions led to important developments in text design. Advance organizers, clearly stated learning objectives, summaries and in-text questions - all these features turn the text into something with which the learner engages

² You can find an interesting discussion of the same source in 'The written world', a chapter by Feenberg in "Mindweave" (Mason & Kaye, 1989).

³ For definitions of distance education see Keegan (1990) or Rumble (1989).

⁴ I prefer the term (educational) technology to 'medium' since 'medium' suggests passivity ('carrier medium'). However, what it is important to see the medium as a tool.

in the form of an inner monologue - or, in a sense, a dialogue with the text⁵ (Holmberg, 1989). A new form of interactivity with the text compensated to some extent for the interactivity with the teacher. Hülsmann (2000) refers to this as 'internal' interactivity' (i.e. interactivity designed into a medium) as opposed to 'external interactivity' (i.e. interactivity with another person). External interactivity may refer to interactivity with the teacher or peers. There are several ways to rank/view these types of interactivity. Teacher-student interactivity may be seen as supporting internal (student-content) interactivity. Or internal interactivity may be seen as preparing (external) student-tutor/ teacher interactivity to make it a 'quality time' encounter. The educational value of peer interactivity is being debated. Laurillard (1993) calls it one of the great undecided hypotheses of educational theory. At the other end of the spectrum are those who see it as essential for 'knowledge building communities'.

Note that later developments of electronic media enormously enhance the potential of internal interactivity, e.g. automatically corrected multiple-choice questions, simulations, and interactive CD-ROMs.

Table 1: Classification of Media in Open and Distance Learning

	Resource media	Communication media
Examples (media/ media use)	print, broadcasting media, audio/ video cassettes, CD-ROM, Internet	tutorials, telephone tuition, correspondence, asynchronous conferencing, videoconferencing, Internet ^a
Characteristics		
- interactivity ^b	internal interactivity	external interactivity
- cost structure	large proportion of fixed costs	mainly variable costs
- location in system	materials subsystem	student support subsystem
- timing	asynchronous	synchronous and asynchronous
- pedagogy	individual learning	group learning

a: The Internet can be used to make learning resources available and for communication. b: The terms external and internal interactivity refer to interactivity between persons (external interactivity: e.g. tutor, student) as opposed to interactivity between students and learning resources (internal interactivity: e.g. book or CD-ROM and student).

The two forms of interactivity can be used to classify media. Hülsmann (2000) distinguishes between resource media and communication media. Traditional distance education emphasizes the use of resource media. As the Table above indicates this has consequences not only for pedagogy, but also for the economics of distance education.

For our purpose it is instructive to look more closely at the communication aspects of correspondence teaching and compare it with conventional classroom teaching. This will allow us to introduce a concept, which we will revisit later in the context of asynchronous conferencing: witness learning.

2.1. Correspondence Study

Correspondence studies use print as a resource medium ('one-way-traffic' delivering the content to be learned) and correspondence by mail to communicate ('two-way-traffic'⁶).

⁵ An early example of designing internal interactivity into a text is the traditional catholic confession guide ('Beichtspiegel').

⁶ These terms were coined by Holmberg (1989, p.2) and identify the two constitutive elements of distance education.

If we compare the communication aspect of correspondence teaching with traditional classroom teaching we find they differ in two important aspects:

- i. responsiveness, and
- ii. group learning.

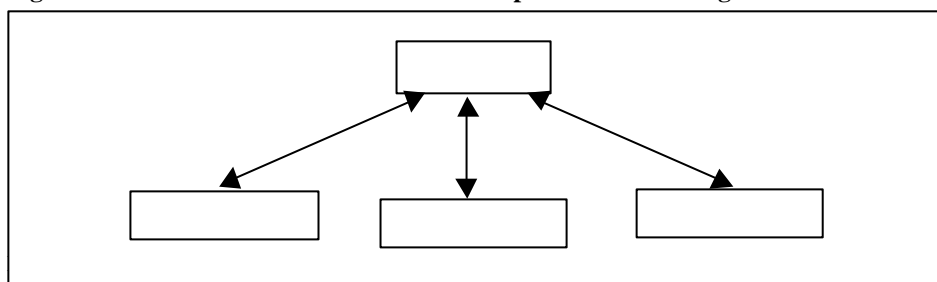
A number of authors have identified the long delay times often found in correspondence teaching as a major weakness (Holmberg, 1989). It is difficult to seriously talk about 'didactic conversation' if the answer arrives when the question is almost forgotten. Time impinges on both motivation and focus. Some authors like Rumble (2001, p. 228) give short shrift to the claim that correspondence teaching can achieve interactivity of a quality comparable to that of a conventional discussion. The rather mechanistic sounding term chosen by Holmberg for dialogue and conversation in correspondence education, 'two way traffic', signals the difference.

Table 2: Two Types of Asynchronous Communication

	Correspondence	Classroom teaching
Time	Long delay time	No delay
Social dimension	Individual learning; Dedicated line to tutor	Group learning; Witness learning

An equally important observation is that in correspondence teaching the social dimension of communication, characteristic for the classroom, is lost. In correspondence education each student has a 'dedicated line'⁷ to the tutor and, generally, no line to his/her peers. This has led to characterizing correspondence teaching as a 'princely education' (possibly somewhat tongue-in-cheek given the low prestige correspondence study often has; cf. Peters in Bernath & Rubin, 1999, p.158). However, it is true that this communication structure is likely to reduce noise and, thus, enhance focus.

Figure 1: Lines of Communication in Correspondence Teaching



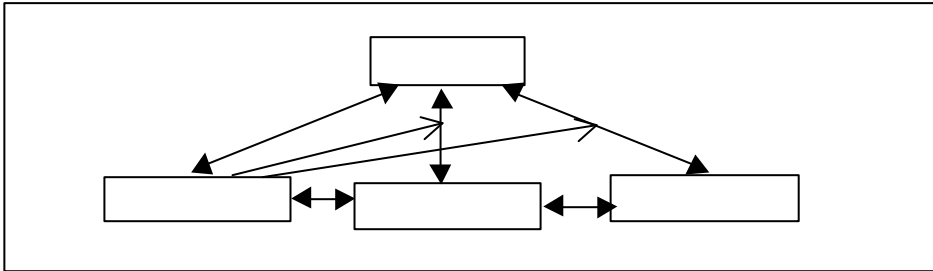
Conventional teaching has an additional social dimension: Students are taught in a class. Historically, such deviation from the 'princely' form of individual tuition was indeed not motivated by the belief that the social dimension of learning in a class is more effective, but was introduced for the rather simple reason of cost-efficiency. Today, although some educators remain skeptical about the value of peer discussions and its contribution to learning, the ability to communicate is highly rated in curriculum planning.

Figure 2 depicts three lines of communicative interactions:

⁷ In telecommunications the expression means a telephone line leased expressly for the purpose of connecting two users more-or-less permanently.

- The teacher communicates with the individual student (as in correspondence teaching).
- Each student observes ('witnesses') other students' interaction with the teacher and learns through this.
- Students communicate and collaborate with each other (peer communication).

Figure 2: Lines of Communication in the Classroom



In the classroom students can witness other students communicating with the teacher. Most learning in traditional classrooms is witness learning.

(Real time) group communication is characterized by 'turn-taking', which means each participant has to wait for his/her turn. This controls the overall volume of exchanged messages. In Holmberg's model of 'guided didactic conversation' teacher-student interaction is predominant. Turn-taking severely limits the individual student's time to directly communicate with the teacher. For instance, if we have a lesson of 60 min with 20 students, each would only be able to articulate him/herself for an average of two minutes. However, in classroom teaching - unlike in correspondence teaching - each student's line of communication is open to other students' inspection, in that all witness their peers' interaction with the teacher and can learn from that. Hence, while on average a student is only able to articulate him/herself for two minutes, he/she will witness 60 min of learning interactions. The conclusion: Most classroom learning is witness learning⁸.

While the 'Socratic discussion' between teacher and student is often regarded as epitomizing the educational situation, witness learning is accepted as the most prevalent mode of learning. Viewed from the individual student's learning agenda many of the learning interactions by others may be irrelevant and redundant, and only at times be a source of richness and variation.

The third type of communicative interactivity is the most contested: peer communication or collaboration. Much 'white noise'⁹ is likely to be generated. Laurillard (1993) calls it "... one of the great untested assumptions of current educational practice" (p. 171). In practice, peer communication and witness learning cannot be strictly separated. Both are a potential source of noise and enrichment.

⁸ Witnessing is a form of attending. According to Laurillard (1993) attending and articulating are two distinct modes of learning. Note that attending (listening, observing, reading) and articulating oneself (speaking) are different in one important aspect: While one student attending does not deprive the other of doing so, one speaking does. In a classroom setting not all can speak to the teacher at the same time.

⁹ 'White noise' is an information science term and means signals not contributing to the information to be transmitted. We use it as metaphor for communications not contributing to the learning process.

Witness learning and peer communication are features not found in correspondence teaching. Having a 'dedicated line' to the teacher filters out noise and focuses the learning process. This 'one-to-one' relationship between learner and teacher is what for Holmberg epitomizes distance education. However, the reality of this 'princely' form of education is a shift of emphasis in the teaching process: away from 'external interactivity' between teacher and learner towards 'internal interactivity' with the course material as the main learning resource. And even if distance education delivers this 'princely' one-to-one relationship between teacher and learner, it nevertheless deprives the student from learning through witnessing or peer communication. There is a trade-off: on the one hand the focus-facilitating 'silence' in correspondence teaching, on the other hand the richness, spontaneity, and immediacy of peer communication and witness learning, which is epitomized by the classroom.

2.2. Later Generations of Distance Education

Garrison (1985) and Nipper (1989) propose typologies of distance education based on the succession of the principal technology used¹⁰. According to this typology correspondence teaching is superseded by the multimedia model, so well prototyped by the British Open University (OUUK). This model relies heavily on the sophisticated use of resource media, including radio and television. With the 'team approach' the OUUK institutionalized a development model, which assures a high level of pedagogical quality.

This use of (then) cutting edge resource media was complemented by rather traditional institutional arrangements for student support, consisting basically of tutor marked assignments, face to face tutorials and summer schools. For non-academic support additional mentoring arrangements were set up.

Two further developments must be observed: (i) the use of synchronous media such as videoconferencing and (ii) computer based teaching and learning, which culminates (as Net-based learning or e-learning) in the development of complete learning platforms¹¹ and supports many teaching functions and modes of learning.

Videoconferencing is vehemently ostracized by Peters (as cited in Bernath & Rubin, 1999, p. 162). I quote his ban in full since it vividly highlights what is assumed to characterize real distance education:

“Let us try to analyze the video-network teaching you have described:

- Is it carefully planned and carefully developed with the support of considerable financial means – which are used for instructional purposes – not for technical media? No.
- Are the best scholars in the given discipline engaged in order to produce a really authentic teaching? No.
- Has there been a cooperation of educational and subject matter specialists? No.
- Has the product - the teaching - been 'objectified'? No.

¹⁰ Taylor (2001) extended the model to a fifth generation of distance education.

¹¹ 'Learning platform' is a generic term for types of software that supports all kinds of asynchronous group communication. Its main feature is the threaded discussion. The more advanced learning platforms include the option to constitute study groups for collaboration, and assignment folders.

- Has the product been mass-produced? No.
- Do the institutions use these networks in order to target the greatest possible number of students? No.
- Do these models try to achieve what Henry Ford had in mind when he produced high quality products at low prices for everybody? No.
- Is this instruction developed in order to reach and help students who were born into socially disadvantaged families and neighborhoods and also to those who can never attend classes on campus for other reasons? May be.”

The reader may later use these questions as a template to decide to which extent asynchronous conferencing might fall under Peters' ban. Like videoconferences, asynchronous conferencing re-introduces the classroom and consequently pacing, thus reducing the flexibility the individual distance learner has traditionally enjoyed. The increased access to tutorial support in asynchronous conferencing makes it possible to abandon extensive development of course materials and instead draws from material which is either already available online or could be made available in the electronic format on short notice. These are notable shifts away from classical distance education¹².

In relation to asynchronous conferencing important fault lines are emerging: between individualized study versus group study, between text and dialogue, and between traditional distance education and the extended classroom. Asynchronous conferencing seems to be able to forge a new synthesis between text and dialogue. Will it be possible to forge a synthesis between individualized study and group learning at a distance?

3. Asynchronous Conferencing

We define asynchronous conferencing as asynchronous communication between human beings facilitated by networked computers. Asynchronous means that those communicating are not present at the same time. There are various software systems that support asynchronous group communication. Some include a number of features typical for educational processes such as posting assignments or working in groups.

We view asynchronous conferencing as a medium "... defined by its technology, symbol systems, and processing capabilities" (Kozma, 1991, p. 181). Asynchronous conferences are implemented on various 'learning platforms', which have exactly the effects Kozma relates to a technology: "... to enable and constrain ... the symbol system it can employ and the processes that can be performed with it" (p. 181).

In this section we identify generic characteristics of asynchronous conferencing as opposed to face to face discussions. In the next section we re-visit the characteristics identified, this time reflecting the author's experiences when teaching OMDE 601¹³. Table 3 serves as an advance organizer for the discussion in this chapter.

¹² There are critical voices. Cf. Rumble(2001) and Ainsworth(2000).

¹³ OMDE 601 is the code for the *Foundations of Distance Education* course, which is generally the first course taken in the Online Master of Distance education program (OMDE).

Table 3: Seminar Discussion vs. Asynchronous Conferencing

	Characteristics	Seminar discussion	Asynchronous conferencing
1	<i>Medium and its characteristics</i>	Speech Transient Elliptic, carries emotion Rich in detail ('cool', ear and eye)	Text Stable, documented, facilitates analysis, invites reflection ('ripple effect' ¹) Explicit, sustains argument Abstract ('hot' ² , eye only)
2	<i>Time</i>	Synchronous Extends over short times (hours,) concentrated Highly responsive ('real time') No time flexibility	Asynchronous Extends over long times (days or weeks), distributed Medium responsiveness (delay of days) High time flexibility, though paced
3	<i>Space</i>	Shared space High visibility (paralinguistic cues incl. voice, body language) Proximity (low transactional distance) Group identity, community feeling, which can sustain conflict	Distributed space Low visibility (only through written participation) High transactional distance Loose temporary network, low group identity, exaggerated friendliness reflects caution
4	<i>Social dimensions</i>	Group communication Discussion generated by group; Limited possibility for student to sustain customized student/teacher discussion Common group thread (tied chunks of individual contributions)	Group communication Group discussion allows students to sustain individual communication threads with teacher Many threads (to be woven together, e.g. through summaries)
5	<i>Structure of communication space</i>	Linear structure 'Turn-taking' (only one at a time can speak) Individually reduced time to speak, since 'one speaking deprives others of doing so' Medium volume, volume controlled by 'turn-taking' Linear structure, which only incompletely maps logical relatedness of comments Sustained focus	Threaded structure (clusters) Time to articulate oneself not limited: All may 'speak' at the same time Volume varies: Possibly much (white) noise; at times deadly silent Threaded structure better reflects logical relatedness of comments Distributed focus
6	<i>In/efficiencies</i>	Speaking, pointing out, is more time efficient than writing Low/medium redundancy (due to 'turn taking') Class control at arm's length (teacher can 'shut up' students, entice others to participate).	Writing takes longer but is less transient; some comments are re-usable High redundancy ('all participants speaking at the same time') Class management tools limited: The teacher can neither silence the participants, nor directly address questions to specific students.
7	<i>Quality</i>	Spontaneous Pace keeps motivation sustained Concentrated, focus kept Openness, contingency of debate	Reflective Motivation to be rekindled at each time of access Arguments to be reconfigured at the time of access Openness within pre-determined structure, confined contingency

¹ Bernath & Rubin, 2001; ² McLuhan as cited in Goyder, 1997

3.1. The Medium and its Characteristics

A traditional face to face discussion uses language (speech) as its medium of communication. It is so common that it is largely invisible to us and we would hardly regard 'speaking to each other' as making use of a medium of communication. However, if a medium "... can be defined by its technology, symbol systems, and processing capabilities" (Kozma, 1991, p. 181) then 'speaking to each other' makes use of a medium of communication. The technology includes the features of our body, which allows us to generate utterances, the symbol systems include words, and processing characteristics include both rules of grammar and logic.

Important for the medium of speech is the shared context and interactivity. Understanding the meaning of your interlocutor's intention is not done in a process of decoding and encoding but by interpreting the speaker's intention on the basis of a shared context. Shared context is important for interpreting the speaker's intentions, and interactivity is important in asking for and getting the clarification required. It was this that Plato criticized with respect to text. The text seems to speak reasonably to you, but when you ask questions it can do little more than repeat its mantra. Taken out of context the text is helpless.

Nonetheless, there is little doubt about the utmost importance of texts. One important characteristic of a text is its stability as compared to the transient character of a verbal message. A complicated argument (e.g. a mathematical proof) requires textual stability for analysis. Textual stability allows analysis, invites reflection, and facilitates criticism and innovation. This applies to the individual situation when "... readers will use the stability of text to recover from comprehension failure" (Kozma, 1991, p. 184) as well as for society as a whole, where the ability to deposit knowledge in a written (and easily retrievable) form is a precondition for innovation.

Asynchronous conferencing can be seen as a hybrid medium sharing the communicative interactivity of 'speaking to each other' and the stability of the textual medium, which facilitates analysis and invites reflection. As such the hybrid addresses some of Plato's criticism of writing as producing texts that seem to talk reason but cannot answer questions. Text-based asynchronous communication does both – it sustains analysis and reflection and answers questions. It would be interesting to know what Plato would have made of these 'texts which do talk back'.

I may include a reference to McLuhan. I find analysis of hot and cool media to be slightly confusing (cf. Goyer, 1997, chapter 7: Communications: Hot and Cool), but it allows us to point out a feature of textual communication we will use later. McLuhan's distinction between hot and cool media could be explained by evoking the notion of symmetry in two different respects: the ratio of senses engaged, and the reciprocity of interaction. Symmetry is cool. If the senses are engaged in a balanced and even way (symmetrically) the medium is classified as cool. If the medium allows reciprocity of interaction it is cool. Print (text) is hot since it skews the sense ratio by 'numbing all senses' except the visual one. At the same time, it is hot because texts do not talk back.

Here we are: Asynchronous communication is paradoxically hot and cool. Hot because it shares the feature of text to numb all but the visual senses, cool because texts in this medium do talk back. We may forget the distinction of hot and cool, but the idea of the skewed sense ratio seems important in our context. In text based communication you

are perceived through your texts and through your texts only: You are visible only through your texts. To paraphrase Berkeley's "esse est percipi" for our context: In asynchronous communication you are perceived through your message, you are identified by your message, you are your message¹⁴. We will see that 'being visible only through ones texts' is of some importance for our analysis.

3.2. Aspects of Time

Asynchronous communication here is defined as a form of computer mediated, i.e. electronic communication. This means that the delay-times of responses can be scaled down close to real time. It is this enhanced responsiveness of electronic conferencing compared to correspondence that is rightly seen as an important advantage. Holmberg (1989) identifies timely responses as important for the process of learning. They impinge on motivation, focus, and efficiency. If you receive your answer when the question is almost forgotten, your eagerness for the answer as being instrumental for propelling your studies forward, is likely to be lost. The focus is eroded over time and you need to make efforts to re-configure the original question. The implied inefficiencies are obvious to anyone who has tried to play chess at a distance.

Hence, real time responsiveness is technically possible in asynchronous conferencing and thus gives it a distinct pedagogical advantage over correspondence teaching. However, in reality asynchronous conferences do not have, nor do they aim at real time responsiveness. Why is this so? Why is the immediacy, which is technically possible not seized? The reason for this is that immediate responsiveness in asynchronous conferences, i.e. classes, implies that all participants must respond immediately. This requirement for immediate responsiveness boomerangs back and constrains the flexibility cherished by the adult distance learner. Responsiveness in asynchronous classes therefore is not determined technically, but negotiated socially¹⁵.

Especially students appreciate immediacy as far as the tutor is concerned for the very reasons mentioned above: to avoid the inefficiency of re-configuring anew the old issues (this being not only an intellectual, but also a motivational problem). Technically the required immediacy is achievable. Using labor for labor substitution, which puts more adjunct faculties on the communications frontline, institutions could achieve the responsiveness of a call center for their student consumers. So far costs have put a cap on this, although some online training institutions guarantee a response within 24 hours.

Asynchronous conferencing implies pacing due to the group dimension of the communication process. If you wish to learn as a group you must accept pacing. We will come back to this point (cf. 3.4: The Social Dimension).

¹⁴ George Berkeley (1685-1753) uses the formula 'esse est percipi' both, in his 'Principles of human knowledge', and the 'Three dialogues between Hylas and Philonous'. Berkeley "... holds that external objects exist only as they are perceived by a subject. Thus, the mind produces ideas, and these ideas are things; to be, then, is to be perceived." (IEP, The Internet Encyclopedia of Philosophy).

¹⁵ It may be interesting to include a note on chat. Chat is often taken as a synchronous form of communication. However, as we will see, it shares essential features with asynchronous communication, e.g. that 'all can speak at the same time'. In this sense chat can be regarded as a form of asynchronous communication, while lacking the essential management of threading.

Asynchronous conferences generally extend over weeks rather than hours. This means that even if technically the time difference between a question and its answer can be (and is) reduced, the questions themselves are asked with some delay. The working/learning pattern of students is to access the class intermittently twice or thrice a week. If the volume of communication in a class is high students may have between ten and forty messages to read. This is different than the situation in a traditional debate where all are present over the whole time of the debate. Intermittent class participation, an intrinsic characteristic of asynchronous conferencing, generates the problem of coping with volume while at the same time focus is eroding and motivation is waning.

But time also allows for reflexivity. In asynchronous conferences messages are not exchanged with the immediacy of a traditional discussion. Participants may not respond immediately. The delay between reading and responding may extend over some days allowing "... the reader to think over the dialogue for a while, rethink it later or even sleep over the messages, before responding. It seemed to be much like throwing a stone into the water (the incoming messages) and seeing the ripples expand outward (the pondering on the content of the message)." (Bernath & Rubin, 2001, p. 220).

Bernath describes this process as the 'ripple effect' – suggesting that the time delay is an incubation period during which the answer takes shape and weight.

This delay of some days may even sustain motivation. Since in asynchronous conferences the author only 'exists' through the written message, all authors are impatient to have their existence confirmed by being perceived in attracting a response. This applies especially in early phases of a course where an online presence is being established. The combination of only being visible through text and the irrevocable stability/permanency of posting the text to the public forum of the class conference produces anxiety. Waiting for a response has an element of Hitchcockian suspense: Will I be seen/noticed? What will they make of it? As soon as you find time, you check the 'unread messages' and see whether someone has commented to your response. Attracting responses gives a motivational boost teachers and peers should be aware of.

The specific level of delayed responsiveness so characteristic of asynchronous conferences has important implications. The level of this delay, however, is not technically determined but socially negotiated. If we want to learn in a group we need to compromise time flexibility and accept a certain level of pacing. Parameters determining the compromise are: flexibility required by students, an institution's budget considerations, and pedagogic deliberations (including motivation, focus, and reflexivity) by students and teachers alike.

3.3. Aspects of Space

Asynchronous conferencing is a mode of teaching and learning at a distance. While in face to face discussions the participants share a common space, in conferencing participants may be anywhere. Again, this increases flexibility and convenience for participants and extends the reach of the institution, but it has far reaching consequences for discussion processes.

In his theory of 'transactional distance' Moore points out that geographical distance in distance education has communicative consequences. Without dwelling on this theory

we note that the analysis acknowledges that geographic separation triggers other, possibly more important forms of distance: Hence the importance of media. The medium used to bridge the distance both 'enables and constrains' McLuhan, possessed by the idea that one medium engages some senses more than others, goes further and says: "... when one area of experience is heightened or intensified, another is diminished or numbed" (as cited in Goyder, 1997, p. 164). Text-based communication filters out all non-textual information. The interlocutor is only visible through his/her comments. If 'being' depends on 'being perceived'¹⁶ than, in asynchronous conferencing being is achieved by posting textual comments. The invisibility of the other in text-based communication has, in more open forms of online communication (e.g. bulletin boards and chat), led to playing with identities. The use of avatars¹⁷ in more controlled environments is unlikely, because access is controlled by various administrative identity checks. However, the absence of paralinguistic cues (e.g. body language, voice), which can immediately mitigate the effects of verbal messages, may eliminate prejudices, but also incite the imagination to create all sorts of fantasies about one's interlocutors¹⁸.

I myself experienced the differences between text based fantasy projections and impressions (possibly also fantasies) when I saw some of my students personally at a UMUC meeting. Some personalities were projected well through the medium of text, whereas for others I needed additional experience to generate more realistic personality profiles than those based on text messages. The old distinction between restricted and elaborated codes comes to mind, where the restricted code depends on contextual supporting elements (pointing, frowning, intonation, gesture), which are all lost when visibility is filtered through text.

Feenberg (1989) suggests that this lack of visibility produces a certain anxiety. This is enhanced by the lapse in time until you see a response, which is psychologically experienced as a form of suspense. Participants tend to skim the 'unread messages' to see if there is a comment on what they have posted. This shared anxiety and vulnerability translates to heightened friendliness leading to a style of much 'backslapping'. This reflects the awareness that visibility is only achieved through explicit comments.

In traditional academic seminars that take place on a campus setting participants may know each other and have ample opportunity to meet outside the seminar. All this possibly creates a sense of community, which may be more than a sentimental notion and impinges on the culture of discussion. While transactional distance, where communication is filtered through a medium, creates suspense and anxiety, the academic seminar 'frames' discussion differently. The 'register' of communication modes extends from irony, illustration by exaggeration, analysis, emotional engagement to sharp criticism and conflict. The rule to avoid arguments 'ad personam' and focus on arguments

¹⁶ Berkeley (cf. footnote 10) is a central figure in J. Gaarder's best selling novel 'Sophie's World' (Gaarder, 1991), which can be read as a novel about studying philosophy by correspondence. I am indebted to Chris Yates for this observation.

¹⁷ According to the Encyclopædia Britannica the Sanskrit word 'Avatara' ("descent") refers in Hinduism to the incarnation of a deity in human or animal form to counteract some particular evil in the world. The term usually refers the 10 appearances of Vishnu. <http://www.britannica.com/eb/alpha?search=avatar>

¹⁸ Thorsten Hülsmann (2000, pp. 45-46)

'ad rem' reflects an old academic culture of debate¹⁹. Constituted under the communication frame of academic debate the sense of community can be sustained under conflict. To which extent the more fragmented situation (distributed focus, reduced visibility, non transient character of comments) is conducive to a 'search for truth' remains to be seen.

3.4. The Social Dimension

We have already said a number of things about the social dimension of asynchronous conferencing. We have observed that the responsiveness in communicative delay is a function of the social dimension of asynchronous conferencing. Pacing is a compromise, reflecting the trade off between flexibility and group communication.

We have compared classroom communication and correspondence communication and seen that the classroom includes at least three modes of communication:

- (i) communication between teacher and student;
- (ii) witness learning;
- (iii) peer communication and collaboration.

Asynchronous conferencing, like learning in class, is different from correspondence teaching. The lines of interaction between student and teacher can be inspected by every student. Like in the classroom, witness learning is possible. We argued that witnessing other people's interaction with the teacher as well as communicating with other students can be perceived as noise, when viewed from a specific student's learning agenda. At times it may be a source of stimulation and motivation. In both directions we see that asynchronous conferencing amplifies both the potential noise and the potential richness of the learning process. While the communicative volume in the conventional classroom is controlled by a process of turn taking, the asynchronous structure of the communicative space allows all participants to speak at the same time (cf. below: Structure of Communication Space). The effect is obvious: Noise and richness rise.

To give an anecdotal illustration: On one occasion the noise levels became unbearable for some students. It was during the module on the *History of Distance Education* led by Holmberg, who has consistently argued that distance education allows one to one communication with the teacher. The class was large, about 30 students, and the flow of messages relentless. Some began to crack and questioned the mode of communication. My response to students in this situation was to argue that Holmberg's emphasis of one-way-traffic (studying the readings) and two-way-traffic (developing one's personal learning agenda through one-to-one contact with the teacher), could be turned into a

¹⁹ The difficulty to distinguish between person and argument seems to be amplified by the medium. However, M. Kakutani (2002), diagnoses 'the diminished debate syndrome' for today's college students in general: "Debate has gotten a very bad name in our culture ... It's become synonymous with some of the most nonintellectual forms of bullying, rather than as an opportunity for deliberative democracy." According to Kakutani the inability to distinguish between criticizing person and analyzing an argument is not just, as it is suggested here, a characteristic of asynchronous computer mediated discussion: "It's as though there's no distinction between the person and the argument, as though to criticize an argument would be injurious to the person...". M. Kakutani explains it with the legacy of deconstructionist discourse in academia and a lived experience of multiculturalism: "It's difficult because it's coming out of genuinely pluralistic orientation and a desire to get along, but it makes argument and rigorous analysis very difficult...". If anything asynchronous communication amplifies rather than cures these tendencies.

guideline for coping with noise. (i) Read the material and develop your own learning agenda; (ii) Post your question to the teacher unperturbed by others, thus developing your own communicative thread.

The anecdote's implication is that to some extent we can see the princely (i.e. one-to-one) mode of learning, which gives each student a dedicated line to the teacher, as being absorbed into asynchronous conferencing. Each student can spin his/her interactive thread of communication propelled by his/her learning agenda, which is anchored in the course readings. However, shutting out the noise means reducing richness. Students need to do both: pursue their own learning agenda and, at times, link it to that of their peers. The role of the teacher is not least to weave these different threads together and thus making the resulting carpet visible for all. An important tool is the posting of occasional summaries.

I do not want to end this section on the group dimension of learning at a distance without drawing attention to the underlying implications since it is here where the fault lines between traditional distance education and e-education are taking shape. Do we prefer studying in a group under the supervision of a teacher? The answer to this question has both a pedagogical and a cost-effectiveness dimension. With regard to the pedagogical dimension, Laurillard (1993) points out that the value placed on peer communication and group collaboration is one of the great untested hypothesis of educational theory. With regard to cost-effectiveness, Rumble (2001) points to the possible value implications of the underlying choice. Learning in a class under the supervision of a teacher, as is made possible by asynchronous communication, may be a step towards re-introducing the cost structure of traditional education and may be incompatible with mass participation in higher education. Should we accept jeopardizing traditional democratic credentials if there are no sound pedagogical arguments (effectiveness reasons) to deviate from the one-to-one education, which Holmberg (1995) believes epitomizes distance education?

3.5. Structure of Communication Space

Being separated in terms of both time and space constitutes a communication space of a structure distinctly different to the one known from face-to-face discussions. Real time discussions are, by their time-bound nature, linear. They have a beginning, a middle, and an end. The time span over which such a discussion extends can be imagined as a line of definite length. A traditional debate is structured by turn-taking: Everyone has to wait for his/her turn to make a contribution and in this way the time line is successively filled out. Since each contribution extends over a certain interval, only a finite number of contributions can be accommodated. In sixty minutes, for instance, twenty participants could on the average speak for only three minutes. For this reason we said that most learning in class does not happen by actively articulating oneself, but by witnessing others doing so.

The finite time, the number of students, all this means that there is competition in articulating oneself. If, with Laurillard, 'articulating oneself' is considered an important mode of learning, most participants in a face-to-face discussion are deprived of doing so most of the time. This is a disadvantage of the traditional classroom, and more so if one considers actively articulating oneself as an important mode of learning. The situation is different in asynchronous communication: Like someone posting messages on a bulletin

board does not deprive others from doing so, in asynchronous conferencing 'all can speak at the same time'.

Table 4: Modes of Learning and Public Goods

	Private good (scarce resource)	Public good ¹ (‘nondepletable’ and nonexcludable)
Traditional classroom	Articulating oneself (e.g. speaking publicly to the teacher)	Any form of attending (viewing, listening, reading)
Online classroom		Any form of attending (viewing, listening, reading) Articulating oneself (e.g. speaking publicly to the teacher)

¹For the definition of public goods cf. Hallgren & McAdams(1997)

To bring out the contrast a distinction made in economics ‘between private and public goods - may be used. While private goods are used up, the more people consume them, public goods are nondepletable and nonexcludable. (Most consumer goods are private goods, the daily bread being the simplest example. National defense is a public good²⁰.) In the traditional classroom any form of attending can be seen as sharing some characteristics of a public good while time to articulate oneself remains a scarce resource (and consequently a private good). Since in the online classroom all can speak at the same time both modes of learning, attending and articulating oneself can be construed as public goods. Articulating oneself in an online classroom is not depletable, nor excludable since one party doing so does not in any way interfere with others doing the same thing²¹.

Let this sink in: If we believe that articulating oneself is important, we have discovered a mode of learning where not only 'attending' is what economists call a nondepletable good, but active participation, the mode of 'articulating' oneself as well. This is a fundamental difference to the traditional classroom, where all can listen all the time, but only one can speak at a time. In asynchronous communication all can listen at the same time *and* all can speak at the time as well.

The obvious consequence is the generated 'white noise'. In information theory this term refers to interfering noise, which makes decoding difficult. For the individual learner asynchronous classrooms can be much noisier than a traditional class. Although even in a traditional class not all witnessed interactions between ones class mates and the teacher are relevant to the individual learning agenda, the ability of the teacher to closely manage and elicit contributions, makes the witnessed interactions in the

²⁰ Hallgren & McAdams (1997): “Everyone in the country, including newcomers and newborns, is protected simultaneously and to the same degree by national defense (whatever it is). Because your neighbor is protected does not mean that you are protected any less. The resource is not depleted by being used by your neighbor; and because your neighbor partakes of its benefits does not mean that you or others are excluded from the same benefits.” (p. 458).

²¹ This paraphrases Hallgren & McAdams (1997): "Knowledge of the Internet is not depletable, nor it is excludable: knowledge enriching one party's understanding does not in any way interfere with the similar enrichment of others." (p. 471).

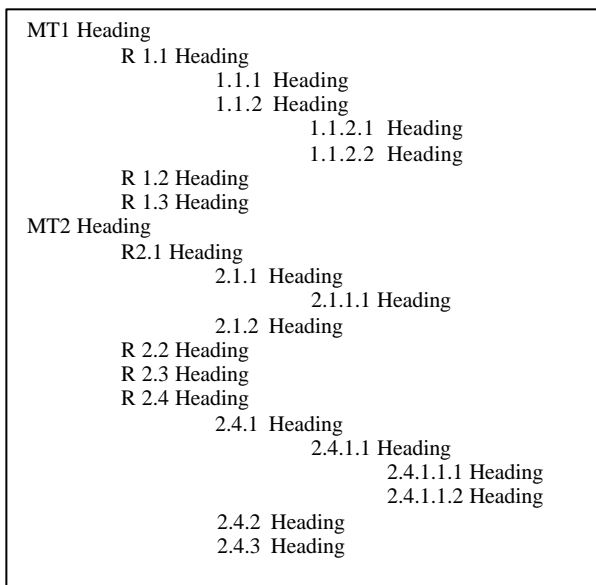
traditional class more likely to be relevant. In good classroom teaching balancing peer contributions leads towards enrichment rather than noise.

The fact that one speaking does not deprive the others of doing so means that 'articulating oneself' in an asynchronous class is not a 'scarce resource' (as it is in the traditional class where you compete for 'articulation time'). This, together with the fact that online tutors have less efficient means to moderate as tightly as a classroom teacher does have (who may immediately interfere to silence someone), creates a high level of redundancies in the asynchronous class.

The problem is that articulating ones own thoughts is most often enriching for oneself, especially if done in interaction with a teacher who can provide feedback. This is not necessarily so from the perspective of the others. Hence, the structural feature of turn-taking in a traditional class protects you from much noise, but at the same time deprives you of learning through the articulation of your own thoughts. The question is: Can the potential richness implied by the possibility of all 'speaking at the same time' be harnessed in a way that it becomes a source of enrichment rather than noise?

Part of the answer lies in threading. 'Threading' in asynchronous conferencing works as follows: Each message receives a number (i.e. the thread number of the message). Messages can either be juxtaposed or attached to a preceding message. The level on which threads start are often called 'main topics'. The *n*th main topic carries the thread number *n*. The *i*th response to the message *n* is labeled *n.i*. Figure 3 shows how discussions threads are displayed through thread numbers. There, review the second main topic (MT2). Responses to it are labeled R 2.1, R 2.2, R 2.3 and R 2.4. These responding messages are ranked according to the time they arrive on the server. Messages that respond to response R 2.4 are then labeled 2.4.1, 2.4.2, and 2.4.3... etc. Figure 3 shows how discussion threads are displayed through thread numbers.

Figure 3: Example for a Threaded Structure



It is threading that distinguishes asynchronous discussions from mere bulletin boards. It also reveals the difference between the linear structure of the traditional debate, characterized by turn-taking, and the 'threaded' structure of asynchronous debates, reflecting the logical relationships between contributions. This brings back into focus the fact that the apparent linearity of traditional debates is a false one. The turn-taking structure, characteristic for the traditional debate, obscures the logical relationships between the contributions. It is as if the threads were tied behind one another, irrespective of where they belong. In conventional debates it is often quite difficult to refer back to a preceding statement. The transient character of the oral message, together with the fact that through turn taking a complicated logical thread structure is forcibly mapped into a procrustean linearity, contributes greatly to the confusion in many debates. The clear and visually explicit threading gives structure and provides a mind map, which can make the high volume of communication comprehensive. There is a trade-off: Threading militates against multiple references in one message, i.e. weaving together various contributions in a complex whole. Chunking, the prerequisite of effectively using the threaded structure is good for analysis, less so for synthesis.²² The answer to the question whether the potential richness of the debate can be harnessed, lies to some extent in the feature of threading, which disentangles the logical relationships obscured in the traditional debate by a false linear appearance.

Participants will need to learn how to contribute to a threaded conference. Threaded conferences imply a format to which participants must accommodate their contributions. First, they need to learn where to place a contribution. Secondly, they need to learn to decompose complicated and lengthy ideas into 'chunks', which can be placed unambiguously.

This evidently impinges on the nature of the contributions. In traditional face-to-discussions all participants are present all the time during which the discussion takes place. When it is someone's turn to finally chip in his/her contribution, this will include references to various points raised at different times during the preceding part of the debate. One could say that the whole history of the debate bears on the last contribution.²³ Analysis of asynchronous conferencing suggests something different. Asynchronous debates extend over longer time spans. Participation pattern is intermittent. At times of access participants may have to cope with high volume of messages while at the same time having difficulty to re-configure the issue and re-kindle motivation. How do they cope in practice? They access the class and see many 'unread messages'. They open a message and read it on the screen. Much more than in a face-to-face debate in the online case attention is drawn to the last message, i.e. to the message opened. In a traditional debate the 'line of argument' (its history) echoes in the minds of all participants, since focus and presence is kept throughout. The online debater's attention will be skewed in favor of the last message. What does this mean? It

²² Perraton, when introduced to this feature, observed that this illustrates that once again the 'technological tail is trying to wag the pedagogical dog'. All (the more important are the summaries and conference wrapping-up messages).

²³ This recalls Hegel: Debates (as well as history itself) progress through dialectical processes of differentiation (distinction, negation) onto a higher level. Hegel uses the German word 'aufheben' (Froeb, (n. d.) reports that the technical term used in English is 'sublate') to describe this form of dialectical progress. The German word embraces connotations of distinguishing (lat. 'negare'), eliminating (lat. tollere') and lifting to a higher level (lat. 'elevare'). In such a debate we see that the whole history impinges on the last argument.

suggests that in face-to-face discussions the 'horizontal integration' of arguments is likely to be greater. Horizontal integration means the way in which the preceding history of the debate (i.e. arguments $1, 2, \dots, n-1$) weighs on argument n . In asynchronous conferences it is likely that argument n is predominantly linked to argument $n-1$.²⁴ Preceding arguments are likely to be shrouded in memory. While full threading principally allows tracing the history of an argument, it requires a considerable amount of effort. It would be helpful to be able to click on a thread number and call up the exact message thread leading to this argument. For example: Assume you have opened the message with the thread number 2.4.1.2. It would be helpful to have a 'View thread' function that displays all the messages leading to 2.4.1.2 in sequence, i.e. the messages *MT2*, *R2.4*, *2.4.1* and *2.4.1.2*. Such a function would help to re-configure the relevant line of arguments and support horizontal integration.

Such features seldom exist although they would be important tools to protect from 'veering off topic'. The fact that only message $n-1$ impinges on message n means that the longer the thread, the more likely it is that contributions 'veer off topic'. This is natural when each topic is discussed without relating back to the issue under discussion (i.e. the main topic). It is as if successive archers were to define 'the hit' of the preceding archer as their new target ('bull's eye') for the one following. It is obvious that in such an arrangement the likelihood of the last archer being way off the original target is great.

However, when analyzing horizontal integration we need to compare like with like. A good discussion is often evaluated according to the extent that 'participants build on the arguments of others' or, even more appreciated, where there is evidence that some participants have modified their ideas under the influence of what others have said. However, a face-to-face discussion cannot be viewed as one integrated line of argument because as analysis suggests, several lines of arguments are tied behind one another in spite of their logical relationship²⁵. Even though, 'building on each others argument' may not be the strongest point in asynchronous communication, if it is true that argumentative history is likely to be forgotten and cumbersome to retrieve.

We could promote a different criterion for appreciating asynchronous discussion in relation to what we call 'vertical integration'. This refers to the logical decomposition of an issue, allowing, if not an exhaustive discussion of the issue at hand, a wide coverage of aspects. Here teachers and course designers have a strong hand: Often they start the debate by decomposing the teaching content into main topics. This 'fans out' the different aspects of the topic.

The decomposition of the theme of a module into main topics needs to be 'comprehensive'. On the level of responses students should also learn to keep the idea of partitioning in mind. What are the aspects of the main topic? To which aspects have others already opened a main topic? Which aspects remain? Is what I want to post better posted as a

²⁴ We may refer to this as a Markov property. Markov-chains are stochastic processes without memory: "The characteristic property of this sort of process is that it retains no memory of where it has been in the past. This means that only the current state of the process can influence where it goes next...." (Lofting, 2000) I am indebted to my colleague A. Kleinschmidt for this observation.

²⁵ I may be forgiven for using the term 'logical relationship' in a slightly vague manner. Programmers sometime use 'parent' relationship to describe the message to which another message has been attached. That I use 'logical relationship' reflects my expectation that the process of attaching a message depicts an argumentative relation. It goes without saying that in practice this is often not the case.

main topic or has it been mentioned as an aside to the responses posted by others? Participants need to become aware of noise as a potential problem and learn to actively manage redundancies.

To draw things together: We have two fundamental strengths of asynchronous discussions, albeit with some irritating side effects. The first is that 'all can speak at the same time', creating potential richness and at the same time being a source of noise. This richness can be harnessed by what turns out to be the second important feature of asynchronous communication: threading, i.e. richness being displayed within structure. While appreciating the threading function, retrieving argumentative history remains a problem. However, the strong aspect of asynchronous communication is most likely not the building on each other's argument or the horizontal integration of the discussion, but the exhaustive coverage of aspects through 'horizontal integration' supported by threading. To achieve this better support of 'horizontal integration' is necessary, which can, at least partly, be achieved by improving software (i.e. full threading and 'View Thread' functionalities).

3.6. Aspects of Efficiency

The structure of the communication space is determined by the parameters of time, space, and the social dimension of group communication. The asynchronous character of posting messages and the distributed times of access produce the effect of accumulating messages. Being separated in time and having only text to rely on reduces visibility. The group dimension allows all to articulate themselves without the volume mitigating effects of turn-taking. There are a number of obvious inefficiencies involved:

- (i) Speaking is more time efficient than writing.
- (ii) Due to the fact that 'all can speak at the same time' the level of redundancies and noise increases.
- (iii) The discussion is extended over a long period and accessed at times of convenience, which means that focus must be re-configured and motivation re-kindled.
- (iv) The moderator of an asynchronous classroom can neither 'shut up' verbose students nor entice participation of low visibility learners.

Most of us type more slowly than they speak. This leads to inefficiencies, since all - even the trivial or practical communicative messages - must be typed. In a classroom situation students can quickly be shown how to turn a table of figures into a graph. If you have to do it at a distance it seems you need to produce a small manual. However, the positive side of such efforts is that if these resources are properly managed they are re-usable. To make items re-usable requires efficient resource management, which is not an entirely resolved issue²⁶.

Comparing the conventional classroom and correspondence teaching shows that from the individual learner's point of view witnessing the class discussion might include distracting elements. These may include contributions, which are irrelevant or repetitive from the perspective of the respective student's learning agenda. In classroom discussions

²⁶ Archiving material in a form retrievable by a virtual agent like 'Uncle Bulgaria' could automatically bring it to the user's attention, but for me this still seems like fiction. Meet Uncle Bulgaria in Masterton (1998, p. 255).

we saw that to some extent turn-taking serves as a noise control, while in asynchronous conferencing this mitigating effect is lost. 'All can speak at the same time'. However, as it is the case for classroom teaching noise can be a source of richness. The amplified noise of the asynchronous classroom is not only the unavoidable downside of the increased opportunity for students to articulate themselves, it may lead to very valuable contributions even from the perspective of an individual student's learning agenda. What is required is learning how to cope. For the student it is important to learn how to 'skim and skip' while teachers help by weaving the various discussion threads together in their summaries posted at the end of each week or module.

Anyone who has sometimes played chess at a distance immediately sees the inefficiencies created by the fact that focus cannot be sustained in asynchronous debates. Debates are designed to extend over a longer time period, not least to accommodate the flexibility requirements of online learners. These debates extend over weeks and the points of access are chosen at times compatible with the learner's schedule. The down side is that at the time of access the learner has to re-configure what has been the issue. Considering that at times of access a large number of messages are/could be waiting not only one thread of arguments needs to be re-configured but several. Students may be unwilling to spend much time beyond reading the message at hand. Nevertheless, the highly documented character of the debate allows to re-configure an argumentative situation in principle even better than the transient character of a face-to-face debate, albeit there the focus is easier to sustain.

To sustain motivation may be even more difficult. There are occasionally messages which trigger the previously mentioned 'ripple effect' in which participants continue to turn a message in their heads. But this may well be the exception rather than the rule. In a heated emotional debate motivation flares up, which is difficult to sustain over a longer period of time. However, 'suspense' may serve to sustaining motivation: We have already referred to the famous phrase coined by G. Berkeley that 'esse est percipi'. Since visibility is only achieved through text messages participants can confirm their classroom existence by writing only. Producing objective messages open to scrutiny, and releasing them to a largely unknown audience generates a form of anxiety. Participants are anxious to see how they will be perceived. This creates an atmosphere of suspense, which may sustain motivation. Teachers could make use of this Hitchcock/Berkeley effect and signal to students that they have been seen ('perceived'), thus confirming their virtual existence.

Class room management is more difficult in an online classroom. Since visual cues are missing there is no possibility to draw a pensively sitting class member into the discussion by dropping a remark like 'Kim does not seem to agree. What do you think?' Firstly, I don't see his/her face, secondly there is no point in elbowing someone into the debate when there is ample space. The situation of the online classroom is framed by the assumption that there is no interference from or competition with other students, which could be seen as a barrier to seizing interactive opportunities. Why then point out to a student that he/she should not always occupy the stage because other voices could not be heard? In online classrooms there too is a psychological fallout, often generated by high quality, immediate, frequent, and lengthy contributions, which are perceived as intimidating.

4. Experiences from the *Foundations of Distance Education* Course

In this section we shift levels from the more theoretical level of analyzing asynchronous conferencing to the experiential level of describing a concrete course: OMDE 601, *Foundations of Distance Education*. This section outlines the content of this course, looks at the learning platform 'WebTycho' and its navigational features, which facilitate communication, and goes on to discuss the problem of 'coping with volume' before taking a closer look at aspects of quality. This is based on only a small segment of one of the course modules and serves purely illustrative purposes²⁷.

4.1. Course Outline: OMDE 601

The *Foundations of Distance Education* course is structured in four modules:

- Module 1: Introduction,
- Module 2: History and Principles of Distance Education
- Module 3: Pedagogy of Distance Education and Theoretical Approaches to Distance Education
- Module 4: Institutional Aspects of Distance Education

Module 1 introduces the program and allows participants to become acquainted with the learning platform as well as with one another. Early on students are given a group task in the hope that this helps reduce anonymity and increases mutual visibility in a smaller group. The task requires participants to discuss their previously existing (or non-existing) experiences with distance education and to suggest a definition.

Module 2 goes on from there and suggests a definition, traces the history of distance education, and identifies its constitutive elements. The module includes introductions by Holmberg, the 'visiting expert' in this module.

Module 3 discusses the pedagogy of distance education based on readings from Moore and Peters, and discusses theoretical approaches to distance education, including Peters' theory of distance education as the 'most industrialized form of teaching and learning'. Peters himself is the visiting expert in this module.

Module 4 is about distance teaching institutions. This module asks students to undertake a major collaborative project. They survey distance education institutions and classify them according to organizational models they consider relevant.

4.2. WebTycho

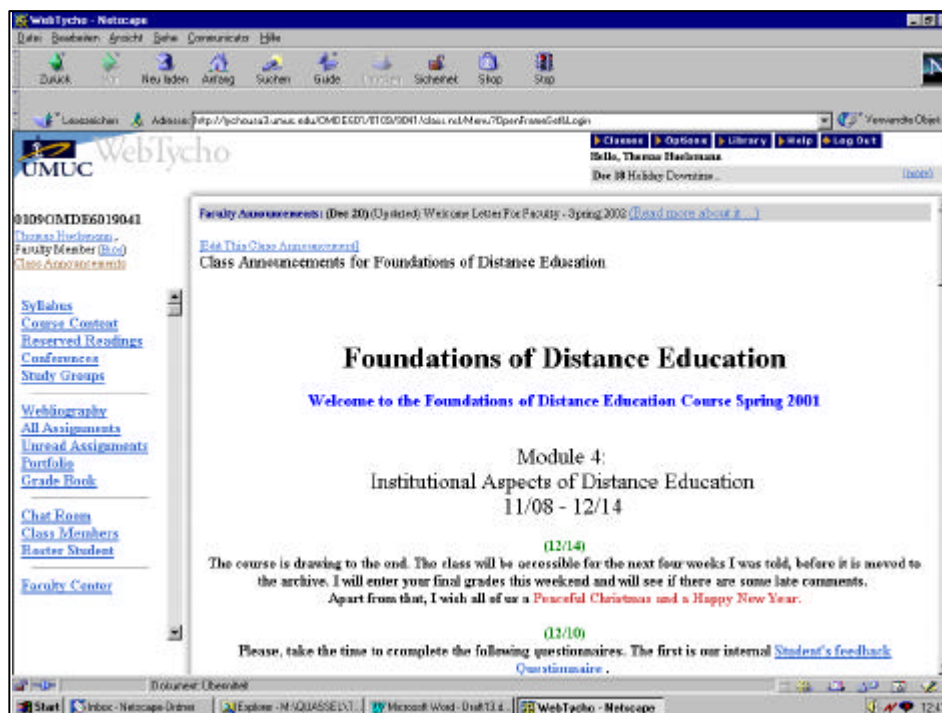
The asynchronous communication in these seminars is supported by WebTycho²⁸, UMUC's proprietary learning environment based on Lotus Domino. The screenshot below shows the navigation pane on the left, which starts with Syllabus. In Syllabus the course objectives are identified and the schedule, which also informs about the course's pacing, is laid out. Course Content and Reserved Readings make the required and suggested readings for this course available and name the necessary textbooks.

²⁷ The next chapter re-prints a slightly edited version of a collaborative group exercise carried out by students of this course.

²⁸ In honor of Tycho Brahe, the Danish astronomer (1546 - 1601)

Conferences, which is the core feature of the course, will be analyzed in some detail below. Study Groups allows the teacher to divide the class into groups in order to work collaboratively on specified tasks.

Figure 4: Screenshot OMDE 601

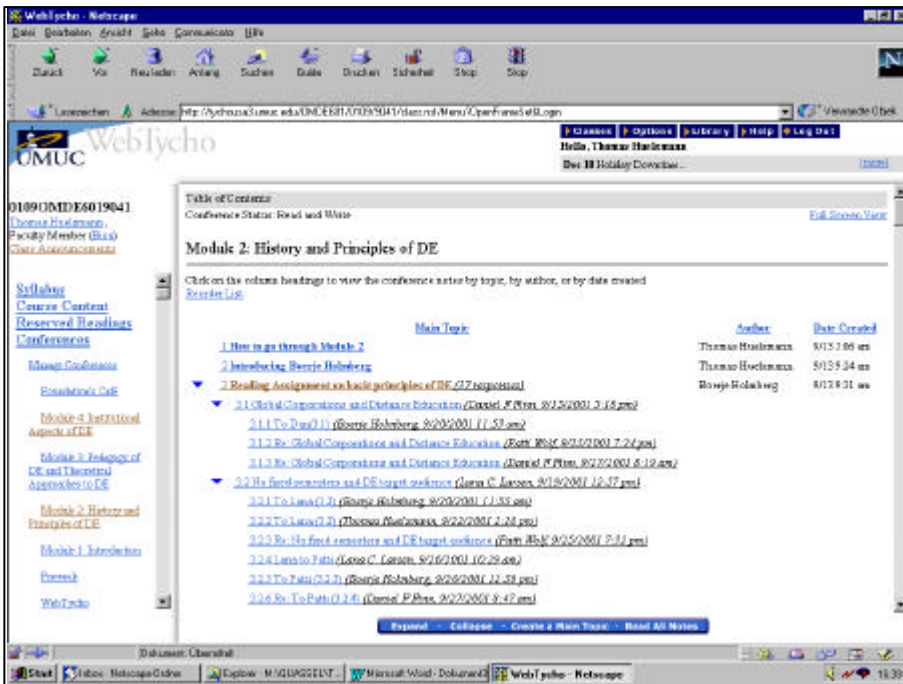


In Weblogography teachers and students designate course related web sites. Then follow some assessment functionalities: All Assignments is the space where students upload their assignments for grading and feedback; The Portfolio provides the teacher with quantitative information on students' contributions. While teachers have access to the all students' Portfolios, a student can see only his/her portfolio. This also applies to the Grade Book, which automatically compiles the grades entered in All Assignments.

The last group of features includes a Chat Room²⁹ facility (which logically would belong to the communication features like Conferences and Study Groups) and administrative features such as Class Members and Roster Students. This left navigation pane ends with the Faculty Center.

²⁹ A note on chat: Chat is often regarded as a synchronous form of communication. In this respect it is usually compared to personal face to face communication. But this is a superficial comparison. In fact, chat is much more similar to asynchronous conferencing, due to the fact that, as in asynchronous conferencing, in chat 'all participants may talk at the same time'. Therefore, rather than sharing the linear structure of the face-to-face debate, which is characterized by 'turn taking' it generates discussion clusters or threads. However, chat transcripts are linear since the software for chat does not support threading. This means that chat generates all the managerial problems of asynchronous discussion without providing the software support to manage them.

Figure 5: Screenshot Showing Threading in WebTycho



The main navigation pane on the left of the screen is complemented by a smaller one on the top. 'Classes' is a tool giving the teacher quick access to the other classes he or she teaches. 'Options' allows customizing the main panel to some extent by setting preferences. 'Library' is where students may access UMUC library facilities while 'Help' gives access to the UMUC help desk.

Since this paper is on asynchronous communication, it is the conferencing feature of WebTycho (i.e. Conferences), which we need to look at more closely. The most important observation here is that WebTycho supports threading only to the third level. These levels are referred to in WebTycho as Main Topic, Response and Aside. Recall what was previously said on how threading works: Each message gets a number. If a message has the number n , the i th response to the message n is labeled $n.i$. Consider the third Main Topic: Responses to it would be labeled 3.1, 3.2, 3.3, ...etc. The messages would be ranked according to the time they arrive on the server. If messages are responding to, say, message 3.2. they are labeled 3.2.1, 3.2.2, 3.2.3... etc. The display of the threaded discussion identifies the different threads. The number 3.4.12 means that the so labeled message is the 12th Aside to the fourth Response on Main Topic 3. However, since beyond the level of Asides no further threading is supported, 3.4.12 may be commenting on 3.4.7 which in turn may comment on 3.4.3.

Figure 5 shows a part of conference Module 2: History and Principles of DE. You see a part of the expanded version. For the sake of simplicity we will assume that this is the complete Main Topic 3.

The logical structure exhibited in the screen shot is displayed in the diagram below: Main Topic 3 receives two Responses (thread number *R 3.1*) and (thread number *R 3.2*). *R 3.1* receives three Asides *A 3.1.1*, *A 3.1.2*, *A 3.1.3*. *R 3.2* receives six Asides *A 3.2.1* to *A 3.2.6*.

Figure 6 presents the situation of the above screenshot depicting the three levels for which threading is supported by WebTycho.

Looking at the headers (or analyzing the messages themselves) reveals how the Asides are related to each other. Analysis of the thread emerging from *R 3.2*, for example, shows that *A 3.2.4*, *A 3.2.5*, and *A 3.2.6* are comments on *A 3.2.3* rather than the response *R 3.2* (all refer to a message by PW). Hence, if WebTycho were to support threading to a level beyond level three we would have a thread structure as depicted in Figure 7.

Figure 6: Incomplete Threading

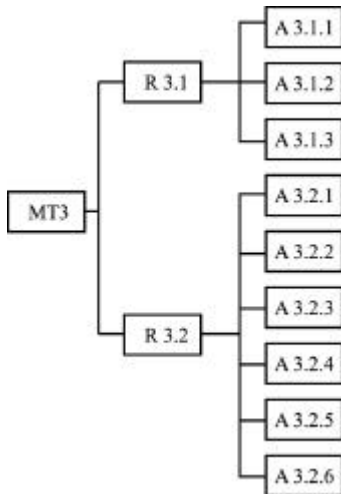
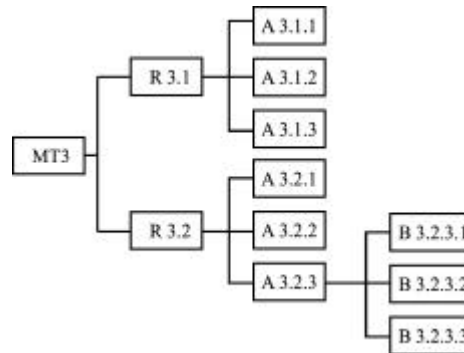


Figure 7: Complete Threading



In Figure 7 the situation of the above screen shot if threading would be supported to a level beyond the Asides. This new level is referred to here (tongue-in-cheek) as 'Besides'. *A 3.2.4*, *A 3.2.5*, and *A 3.2.6* turn into *B 3.2.4*, *B 3.2.5*, and *B 3.2.6*. (If we would continue A logical continuation with thread numbers would be *B 3.2.3.1*, *B 3.2.3.2*, *B 3.2.3.3*.)

Why is it important to have complete threading? As mentioned above one of the strengths of asynchronous communication is that the logical structure between contributions is better reflected. Turn-taking forces arguments into a linear structure notwithstanding their logical relationships. Hence, to *not* support complete threading precludes the opportunity to fully display the logical relationship between arguments.

Furthermore the threaded display of structure allows to some extent to cope with the potential noise level of asynchronous discussions (recall: 'all can speak at the same time'). Threading imposes structure and makes the high communication volume comprehensive, thus harnessing the noise and making it a source of enrichment.

The lack of horizontal integration was identified as a weakness of asynchronous communication and a clear display of threads would allow identification of 'lines of arguments' (i.e. the thread leading to a particular comment). If participants are to be aware of the history of an argument rather than just the last one at hand tracing a thread is important.

The 'View Thread' functionality of WebTycho serves this purpose only poorly. If wanting to re-configure the line of argument leading to the opened comment in the Aside A 3.2.5. Figure 7 suggests that a full text display of *MT3, R 3.2, A 3.2.3* ending with A 3.2.5 is needed. By pressing 'View Thread' the full volley of the text messages *MT3; R 3.1; A 3.1.1, A 3.1.2 A 3.1.3; R 3.2; A 3.2.1, A3.2.2, A3.2.3, A 3.2.4, A 3.2.5, A 3.2.6* is displayed. This is not only much more than wanted, but the lack of structure beyond the level of Asides makes it difficult to sift out what matters. To reconstruct the relevant line of argument, i.e. *MT3, R 3.2, A 3.2.3, A 3.2.5* requires extensive browsing through content, which many users (myself included) find too cumbersome. This shows that WebTycho's software designers do not reckon supporting the horizontal integration of arguments is worth the effort. Experience also shows that the participants themselves do not believe that tracing the 'lines of arguments' are worth an additional effort. When asked to include the thread number in the header of the message one is addressing, only a few students adopted the practice. By including so called 'tracer numbers' it would become possible to reconstruct an argument's history where it is lost due to incomplete threading. For example: If A3.2.5 had included in its header 3.2.3 to identify the thread number of the target, headers would look like this:

3.2.5 Message to Patti (3.2.3)
Thread number; Header title; (Tracer number)

This is practiced in Figure 6: Incomplete threading, last message header. However, the message was posted by a faculty member and students rarely adopted this practice. There is some evidence that neither on the design level nor on the user level much need is seen to improve 'horizontal integration', i.e. the awareness of the history of an argument. In this author's opinion incomplete threading with an almost useless 'View Thread' functionality has a decidedly negative influence on the quality of a discussion. An indicator for good quality is participants' building on each other's arguments and evidence that their position in the course of the discussion is modified. The weak functionalities enabling horizontal integration suggest that asynchronous debates on WebTycho type learning platforms are likely to function poorly.

4.3. Coping With Volume

The potentially high volume of messages in asynchronous conferences is a consequence of a structural feature: All can talk at the same time without mutual interference. Articulating oneself in asynchronous classrooms is a 'non-consumable good'. This was identified as a source of both noise and potential richness.

In the analysis of 'aspects of time' we said that asynchronous conferences typically extend over weeks rather than days or hours. They are popular as modes of study for adult learners because participation can be flexibly integrated into the learner's schedule. This makes participation intermittent. The problem of lost focus and motivation has been identified.

Together, intermittent participation patterns plus high message volume can cause participants, at times of access, to be confronted with large numbers of new messages (signaled as 'Unread Notes'). This will be illustrated empirically. The figures displayed in the following tables relate to the conference held by Peters in OMDE 601 (Fall 2001). The respective main topics are number four to number nine.

Table 5 depicts the number of messages per main topic while the conference was developing. After a slow start volume rapidly increases and stays on a high level almost until the end. Altogether, the debate extends (effectively) over 11 days and draws 147 comments including those of faculty. Most informative is the last row in the table where for each day the 'accumulated number of messages having arrived up to this day', is displayed. The significance of these figures is in showing that volume is too high to cope with if participation is infrequent. Assuming a not unrealistic login pattern of 'once in three days' we see 5 messages on Day 5, which is quite manageable; we deal with them. On Day 6, however, we would have 57 (62-5), which is an obviously unmanageable amount.

Table 5 : Distribution of Comments Over Main Topics

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Sum
MT4	1	0	0	6	1	5	0	0	0	1	0	14
MT5	1	2	0	9	6	6	12	8	9	10	6	69
MT6	0	0	0	1	2	1	0	0	0	0	0	74
MT7	0	0	0	9	5	1	5	2	8	1	2	33
MT8	0	0	0	1	0	0	1	1	4	3	1	11
MT9	0	0	1	0	2	2	1	4	3	3	0	16
Sum	2	2	1	26	16	15	19	15	24	18	9	147
AS	2	4	5	31	47	62	81	96	120	138	147	

AS= Accumulated Sum

If one takes into account that these messages are distributed over six different main topics (12 for MT4, 21 only for MT5, 4 for MT6, 15 for MT7, 1 for MT8, and 4 for MT9), which are as different as 'the industrialized mode of teaching and learning' and Moore's concepts of 'structure, dialogue and learner autonomy' this is very likely to have a disintegrating effect on focus. It is not possible to concentrate on one issue since there are six to be processed in parallel.

Table 6 looks at the same conference from the perspective of the individual participants. Of the 30 participants 21 participated visibly. The trajectory of e.g. FE's participation, with a (visible) access frequency of five is quite above the average access frequency of 2.4. However, even for FE the volume of communication must be difficult to digest at times. Day 4 has 25 messages to read, the next access Day 5 has fifteen new messages. On the next day of access (Day 9) 80 messages await to be read. The volume then drops off, and on Day 10 there are 17 messages, on Day 11 there are only eight messages to be read.

The calculation in Table 6 is predicated on the - probably wrong - assumption that each time a class is accessed a message is posted. The calculation reflects the overload of messages participants would have to cope with if they only logged in to the conference two or three times and felt they needed to keep track of everything said. However, it is likely that many participants access the classroom more often.

Table 6: Distribution of Comments per Participants

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Sum	AF
FAC	OP	0	0	0	4	3	12	0	2	13	6	4	44	7
1	AC	0	0	0	0	0	0	0	0	1	0	0	1	1
2	BP	0	1	0	3	0	1	0	0	0	0	0	5	3
3	BS	0	0	0	0	0	0	0	2	0	0	0	2	1
4	CF	0	0	0	0	0	0	0	1	0	1	0	2	2
5	CS	0	0	0	0	0	0	3	2	0	0	0	5	2
6	CY	0	0	0	0	2	0	1	0	0	0	0	3	2
7	DF	0	0	0	7	3	0	1	0	0	4	0	15	4
8	FE	0	0	0	1	1	0	0	0	2	1	2	7	5
9	GB	0	0	0	1	0	0	0	0	0	0	0	1	1
10	JS	0	0	0	0	0	0	0	2	0	0	0	2	1
11	KC	2	0	0	0	0	0	1	0	0	0	0	3	2
12	KS	0	0	0	0	0	0	0	0	0	4	0	4	1
13	LS	0	0	0	5	4	2	0	1	0	0	0	12	4
14	MN	0	0	0	1	0	0	0	0	0	0	0	1	1
15	PH	0	0	0	0	0	0	0	0	0	0	2	2	1
16	PW	0	0	0	0	0	0	4	0	5	1	0	10	3
17	RH	0	0	1	3	2	0	0	1	1	1	0	9	6
18	RK	0	1	0	0	0	0	3	3	0	0	1	8	4
19	SC	0	0	0	1	0	0	1	0	0	0	0	2	2
20	SF	0	0	0	0	1	0	3	0	2	0	0	6	3
21	YS	0	0	0	0	0	0	2	1	0	0	0	3	2
	Sum	2	2	1	26	16	15	19	15	24	18	9	147	2.43
	AS	2	4	5	31	47	62	81	96	120	138	147		

AS= Accumulated Sum; AF= Access Frequency; The figure 2.43 represents the average access frequency.

The participation patterns depicted in Table 5 cast some doubt on the hypothesis of the 'ripple effect', which suggests that participants read first and answer days later, having pondered intermittently about the message. Prima facie evidence suggests that participants treat new messages in batches rather than giving them time to 'ripple'. Examples of participants with high rates of participation (messages posted) are DF (15), LS (12), and PW (10) messages. DF dealt with 7 of 15 postings on the same day. For LS the bulk of the work was done in two batches of 5 and 4. The same applies for PW. While this does not disprove/dismiss the notion that some messages will occupy the learner over several days, there is some evidence that a student who has blocked a certain time for conference participation will read incoming messages and 'be done with them'.

These figures suggest that volume can be a problem and that focus is in danger of being eroded, both due to the distribution of required attention over too many main topics and due to the intermittent access distributed over too long a time span. Faculty need to provide guidance on how to cope with volume. Recommendations include:

- (i) do not require a minimum number of messages to be posted; token participation increases noise and may impinge negatively on quality; understanding that debating is a testing ground for assignment writing should suffice to entice participation;
- (ii) recommend that participants concentrate on some threads; make it clear that participants are not expected to post comments to all main topics;
- (iii) in cases of high volume emphasize the 'constitutive elements' of distance education according to Holmberg: The readings and contact with the tutor encourage students to concentrate on the readings, develop their respective learning agenda, and use the class discussion to seek the necessary clarification from the teacher. (This would be tantamount to a tactic withdrawal from peer interaction.)

The fact that richness requires making choices implies that not everyone should participate everywhere. All the more important are the occasional summaries that draw things together and sift out what, at least according to the teaching faculty, is relevant enough to be retained.

4.4. Quality of Discussion

There are different indicators of a good discussion. They include the following:

- (i) *Participation:*
Is there a wide, balanced participation? Is the relation between participation of teachers and students appropriate?
- (ii) *Competence in navigation:*
Do participants post their messages properly? Are they correctly 'chunked'?
- (iii) *Empathy and trust:*
Does the manner in which the discussion is conducted reflect the trust required for criticism?
- (iv) *Focus and motivation:*
Do participants keep the debate focused on the issues at hand? Do they build on each others' contributions?
- (v) *Structure:*
Is the debate sufficiently well structured to allow a comprehensive, if not exhaustive treatment of the issue?
- (vi) *Reflexivity:*
Do postings show 'investment of thought'? Are they sufficiently substantial to advance the debate?

To inspect the quality of the debate I relate to an analysis participants in OMDE 601 made of a specific number of threads in Module 2: History and Principles of Distance Education. An edited version of the students' contribution is printed elsewhere in this volume. Participants were asked to conduct a 'debating club' type of discussion on the question whether asynchronous conferences can be equal to or outdo traditional forms of (face-to-face) discussion. For this purpose participants were asked to choose a number of main topics as the informational base from which evidence for both the proposers and the opposers of the motion could be provided. (Since WebTycho does not support full threading, I include a fully threaded display of this part of the discussion in the appendix Figure 11.)

(i) Participation:

The appendix contains Table 7 with conference statistics for the whole of module 2. These statistics are the base for the participation diagrams (Figures 8-19). We have 25 students (without the three dropouts) and all but two participated. For the non-participation of these two there were good professional reasons. It can therefore be concluded that participation is high. Regarding the proportion of teacher's and students' participation 56% of the 'words' in this conference were said by students³⁰.

However, participation varied greatly. Without the dropouts and faculty we have 25 student participants. If participants contributing less than 500 words are defined as of 'low visibility', half of the students were 'low visibility learners'. Beaudoin³¹ points out in this volume that there is some evidence that those who do not visibly participate do nonetheless participate. However, emphasizing that 'all can speak at the same time' as perhaps the major advantage of asynchronous conferencing, it is irritating to observe that not more students seize upon this opportunity to 'articulate themselves'. If the argument that articulating oneself is an important mode of learning is taken seriously, than between 40% and 52% did not make much use of this opportunity. Classifying students who contributed more than 2000 words as 'high visibility learners' leaves four (or 16%) who make full use of this feature of asynchronous communication.

(ii) Competence in navigation:

Argumentative behavior in a face-to-face debate and in a threaded online discussion must be different. In a way, contributions to a traditional debate are more like real threads: When finally making ones points, contributions will be 'twisted' into the preceding argumentation. By making references to various preceding comments one develops what is really to be added. The argument is likely to bring together different elements. On the other hand to properly attach an Aside to a Response the author of a message would need to divide it into different chunks. Each chunk must then be attached to its corresponding response or aside. There are cases where an author makes multiple references where it might have been more appropriate to 'chunk up' the message into three and attach them to three different target messages (cf. Fig. 11, Aside 3.4.3). The format requires dividing 'complex wholes' into unambiguous chunks. It requires avoiding ambiguity, is conducive to clarity, but militates against complexity.

(iii) Trust and empathy:

The evidence of empathy in the analyzed threads was rather consistent. The tone is friendly and perceived as being friendly³². Communicative behavior complied with Holmberg's empathy requirements. However, the display of empathy is not aimed at keeping participants pampered in a 'comfort zone'. Rather, it is instrumental for building trust and forming a sense of academic community, which can sustain conflict without which criticism is not possible. The analyzed sequence included incidents of what might

³⁰ Note that even this number is underplaying student participation in the actual debate since they include introductions and messages pertaining to classroom management issues rather than to the debate.

³¹ Cf. Beaudoin in this volume.

³² During all the courses I taught I only twice had a more severe conflict, whereby one of them escalated to a conflict between students. The incident showed however, that since communication is merely text-based (and no body language or facial expression can temper the text message's meaning), it is all the more important that textual messages reflect empathy.

be construed as exaggerated appreciation ('backslapping'), but did not confirm the conjecture that participants would shy away from criticism. Repeatedly, disagreement was stated quite explicitly (cf. Figure 11: Response 3.2 and Aside 3.2.3). The way in which participants balanced the expression of empathy and appreciation, while at the same time clearly stating their disagreement, showed some professional experience with the medium.

The analysis has suggested that reluctance to participate as well as the exalted level of appreciation may both have their reasons in anxiety. The report of the 'role debate' repeatedly stated that participants are intimidated by long substantial contributions of others. In this sense it is not true that 'one speaking does not deprive others from doing so'. Especially, since adult postgraduate learners are a diverse lot, who differ considerably in age, experience, and prior knowledge, it is likely that this is reflected in their contributions. This has an enriching side, since others can learn not only from the teacher, but from other participants as well. But, it also has an intimidating side: 'Will my contribution look silly when compared to some of the others?' The awareness that participants in asynchronous conferences are perceived only by their texts leads to an identification of author and text.

While the investigated threads lend little observable evidence to the claim that participants shy away from open criticism in online debates, many participants have explicitly confirmed this as a norm guiding their communicative behavior. When the idea of a 'role debate' with clearly defined roles, including that of an opposer was introduced, the idea was appreciated. Under the mask of these roles sharper, more partisan, and confrontational lines of arguments were developed.

The main suspicion that online classes would not be able to generate enough trust to facilitate criticism does not seem to be borne out by evidence. However, faculty and participants need to be aware of the low mutual visibility and the resulting strong identification between author and text. This identification blurs a fundamental distinction of academic debate: that of 'argumentum ad rem' and 'argumentum ad personam'. The assignment of roles (proposer of the motion, opposer, moderator, and rapporteur) allows those who would otherwise anxiously cling to an over-polite online personality to experiment with more overt and critical debating modes.

The conclusion is, as already emphasized by Holmberg, that the display of empathy is important. Given the lack of visibility empathy needs to be expressed in order to come into existence ('esse est percipi!'). It is even more important than suggested by Holmberg, because it not only provides comfort and motivation to learn, but establishes trust as a precondition for criticism. Conglomerate groupings in cyberspace are fragile and a trusting atmosphere cannot be taken for granted.

(iv) Focus and motivation:

Theoretical analysis suggests that 'time and noise' endanger focus. The discussion process is drawn out over a long time period with intermittent participation patterns of uneven frequency and participants need to re-configure the issue at hand each time they access the conference. At the same time volume of communication can accumulate, and is distributed over a diverse range of issues. To keep the various threads in mind and possibly weaving them together is difficult. Given the lack of user-friendly functionalities to re-configure lines of arguments there are reasons to remain skeptic.

Although focus is eroded by time and noise it is to some extent kept together by structure. A clear and comprehensive decomposition of a module's theme provides focus³³. Postings generally link well to the directly preceding message, while easily veering off topic the more distant it is from the respective main topic, where the thread is anchored. Both tendencies are confirmed in the analyzed conference segment (an example of veering off topic is the sequence of asides 3.4.6, 3.4.11, 3.4.12, 3.4.14; cf. in Figure 11).

The same features of time and noise that endanger focus numb motivation. One faculty management tool that addresses both issues is provided by the frequent 'summary', posted by the faculty responsible for the course. Important is that summaries be 'written on the fly' and posted almost without delay. One method is to collect the more remarkable students' contributions in a separate file, which can then be quickly edited as a summary or wrapping up message, and posted almost without delay by the teacher. Summaries not only help retain focus, but also re-ignite motivation. As mentioned earlier the close identification of participants with their texts leads to anxiety and suspense. To find themselves referred to by name in such summaries may for some help to positively resolve this suspense and thus affirm identity and sustain or re-build motivation.

(v) Structure:

Two main structural features of asynchronous communication have been identified: the potential richness/noise due to the fact that 'all can speak at the same time', and the decomposition of the debate into logically related segments visualized by threading. Threading imposes structure and possibly harnesses what might otherwise be considered noise into a source of enrichment.

There is a distinction between 'horizontal integration' and 'vertical integration'. Horizontal integration reflects the extent to which contributors build on each other's arguments. As noted, there is evidence that with increasing thread length contributions veer off topic³⁴. Analysis of the practice of answering messages and the weak tool to retrieve an argument's history predict such effects.

Vertical integration is the comprehensiveness with which the issue under discussion has been 'partitioned'³⁵. On the level of responses at least three points of major importance have been identified: the issue of 'pacing', the issue of 'group learning', and the distinction between open learning and distance education (cf. Figure 11: R 3.2., R 3.4 and R 3.5 respectively).

(vi) Reflexivity

The stability of text messages and the asynchronous character of message exchanges suggests that these should reflect substantial investment of thought. Bernath and Rubin (1999) even identified a 'ripple effect', meaning that messages might be contemplated

³³ We have indeed too diverging tendencies. The lack of control by the teacher over the noise, generated by the fact that everyone can speak all the time, and thus the lack of short-range control, which allows the teacher to 'shut up' some students or entice others. And, the enormous influence to impose structure on the discussion by defining the main topics, and rigidity participants have to adapt to; recall Weber's formula of the 'Gehäuse der Hörigkeit'.

³⁴ This is largely due to what was described as the Markov property of the debate: A message is linked only to the preceding ('neighbor') statement/comment, but otherwise the process is without memory. Note that this reference to stochastic processes is largely metaphoric.

³⁵ A partition is an exhaustive, mutually exclusive decomposition of a topic into sub-topics.

over a protracted period of time before being answered. Though our analysis has cast some doubt on this, at least where general practice is concerned, the messages indicate some investment of thought. The average length of messages considerably exceeds 200 words (the statistics in Figure 10, amount to 279 words per message. However, this number is too high since it includes the introductory texts of faculty; the average length of participants' messages would be about 220 words)³⁶.

Analysis suggests that while horizontal integration would be weak, anchorage in the last message should be substantial. Evidence of the analyzed conference segment confirms this to some extent. Generally comments take up a point in the message to which they are attached, and often an explicit reference to a previous statement is made. However, there is an identifiable tendency to quickly move away from the message under scrutiny to the commentator's own professional experience. 'You (the visiting expert) have argued in the readings for this module that this and that is the case. My experience however demonstrates something different.' This pattern is identified in the participants' analysis and leads them to suggest the hypothesis (possibly rendered plausible by self-inspection) that in principle it is possible to get away with a low level of engagement with the course readings.

An interesting thread is the one emerging from *R 3.2*. The message takes a critical position towards the statement implied in *MT 3 (BH)* that absence of pacing is characteristic for distance education. The response *R 3.2 (LL)* draws three asides: *A 3.2.1 (BH)* where the visiting expert reiterates his position; *A 3.2.2 (TH)* where the teaching faculty takes a modified position (arguing that advances in technology allow group work and group work implies pacing); and *A 3.2.3 (PW)*, who joins forces with the critical position taken in *R 3.2 (LL)*. Interesting is that this aside again draws three responses where *LL (A 3.2.4)* retreats from her initial position to accommodate the view of the visiting expert. A further contribution *A 3.2.6 (DF)* joins forces with the visiting expert, arguing that individual studies in the corporate training sectors are preferred and conform to the picture of distance education expressed by the visiting expert. The sequence, albeit short, shows: Participants building on each other's contributions, expressing criticism, and participants modifying their positions to some extent under the influence of the arguments contributed by others.

5. Conclusions

This last section draws things together. It summarizes the strengths of conferencing, identifies trade-offs, and makes recommendations.

Two main areas of strength are identified. One is 'all can speak at the same time'. This does not imply that everyone is 'shouting out of the window' without anyone listening. They speak to the teacher and receive answers. 'Speaking' here means writing a text. Writing texts is not only a way of alphabetically encoding ones thoughts. Writing often brings thoughts into being. It gives them a public form. This is why some believe that articulating oneself in written form is a most powerful way of knowledge building. As

³⁶ It might look unconvincing to take message length as an indicator for 'investment of thought'. However, it indicates that more is done than exchanging short notes on personal or organizational issues. Viewed in the context of a topic related conference discussion average message length is an indicator of effort or engagement (i.e. 'investment of thought'), albeit not an indicator of quality of outcome.

was pointed out in traditional classroom time to 'articulate oneself' is a precious, because scarce good. Asynchronous discussion turns articulating into a non-consumable good. All can do so whenever they want without depriving others.

The second area of strength is structure. In principle, asynchronous conference platforms allow the mapping of logical relations that are obscured by the linear arrangement induced by turn-taking. This works in two dimensions: (i) The partitioning of an issue under discussion into main topics, which 'fans out' the relevant aspects of the theme of a conference or module. This provides anchorage and focus for the discussion. (ii) Threading imposes structure for the ensuing discussion of the main topic. Ideally, argumentative sequences ('lines of arguments') would be identified by a 'fully threaded' display of message headers and selectively retrievable through a 'View Thread' function.

5.1. Trade-offs

The flop side of these good news is that side effects and trade-offs are inherent in asynchronous conferencing. The most obvious is the 'white noise' generated by the fact that 'all can speak at the same time'. Articulating ones own thoughts may be a maieutic³⁷ experience for oneself, but not necessarily of great value for others to witness. The more participants that seize on this opportunity to 'articulate themselves', the higher the communication volume with all the inherent redundancies of asynchronous conferencing.

The problem of volume is not only due to the fact that 'all can speak at the same time', but is also a result of the intermittent participation pattern. When 'Unread Notes' brings forty new message headers to the screen, a problem of 'coping with volume' arises. Given that the conference was accessed three days ago reconfiguring to what the unread messages could relate to is, to say the least, difficult. Argumentative contexts are shrouded in memory, which means that focus is lost and motivation may be ebbing. The need to show presence in the classroom forces participants to work through a batch of messages and post to them.

Anxiety is great in an environment where 'having a life aside one's text' is difficult. One is visible only through the text. Viewing sophisticated peer messages may make one regress to a lurker. When taking a heart and posting a message 'sweet speak' will be used in hope of reciprocity. With considerable suspense the classroom is opened next time to see whether one has been perceived (exists). What can be expected from a communication format where the distinction between person and argument, which is fundamental for academic discourse, is lost?

5.2. Recommendations

In developing asynchronous conferencing it is necessary to build on the strengths and minimize the weaknesses. It is important to harness the richness, and not allow the rich diversity of messages to degenerate to noise. Part of the answer lies in imposing structure in order to make richness comprehensive. This requires technical as well as pedagogical design features. Technicians must become sensitive to pedagogical requirements and

³⁷ Greek maieutikos, from maieuesthai, 'to act as midwife'. It refers to the aspect of the Socratic method that induces a respondent to formulate latent concepts through a dialectic or logical sequence of questions. Writing induces similar processes in the writer.

convert them into software functionalities. This applies to threading and 'View Thread' functions, which would allow user-friendly contextualization of arguments.

Better threading functionalities are foremost a question of software design, but structure is also imposed through pedagogical design. Clear partitioning of a module theme into main topics is important. A conference space should reflect a conceptual structure and be reserved for faculty. To clutter up the 'content' with all sorts of postings reduces comprehensiveness.

Participants must learn to use the structure in an optimal manner. This includes the proper placement and chunking of messages. If the first messages are placed on the Response level students (as a class) need to be aware and repeat what the teacher has done with the theme of the topic on main topic level: to decompose the main topic on the level of responses in order to fan out its various aspects. Well structured conferences, both horizontal and vertical, can accommodate richness and domesticate (minimize) noise.

Anxiety is a central problem. The conglomerate groups of virtual classes are a fragile community. Empathy is all-important - not to pamper participants' desire to stay in their comfort zone, on the contrary, because academic discourse necessitates criticism. Not to keep everyone comfortable, but to engender trust in order to sustain community through conflict, is the issue here.

The suspense with which participants wait for responses can be turned into a motivational force if a participant not only finds a response to his/her message, but also finds that the expressed arguments are taken seriously. Occasionally posted summaries, including the participants' names and referrals to what they said, will boost motivation and help retain focus.

Reflecting the process itself also helps. One innovation introduced in the course was to make participants undertake a 'role discussion'. The objective was to discuss the respective advantages of asynchronous discussions compared to face-to-face discussions, based on the evidence available in an identified section of a preceding module. The idea aimed at reflection and criticism, while the analysis of the available evidence lead to a more reflected awareness. The use of roles, including the one of an opposer, provided a temporary avatar distinct to the usual online persona.

5.3. Wrapping up

Three points are worth reiterating:

- (i) the potential richness of asynchronous conferencing, because 'all can speak at the same time'. If we believe that actively 'articulating oneself' in writing is an important mode of learning, there is ample opportunity; 'articulating oneself', as we called this mode of learning, is a 'non-consumable good' in asynchronous conferences: One using it does not deprive others from doing so.
- (ii) asynchronous communication is characterized by 'texts that talk back'. We saw that Plato's criticism of writing (i.e. that texts seem to talk reason but when questioned only repeat themselves) is partly addressed through this type of communication in that we have the stability of the text format, on which analysis and reflectivity are predicated. Asynchronous communication, combined with the interactivity of dialogue, allows the answering of questions and correction of interpretations.

- (iii) the metonym of 'texts that talk back' already suggests that text and author merge. 'Esse est percipi': One is visible only through texts and the perception of ones text defines the online existence. This close identification between author and text means that the posting of texts is coupled with anxiety, which may explain both the reluctance to actively participate ('invisible learners') and the often irritatingly high level of expressed politeness. It is important to positively resolve the suspense with which the author awaits the reception of his/her text; this affirms existence, strengthens confidence and motivation, and finally, creates the trust so essential for criticism.

Let me end with paraphrasing two great distance educators. Peters, who surveyed and analyzed distance learning extensively, coined the formula that distance education is something '*sui generis*'. Similarly, I see in asynchronous conferencing a communication format that is '*sui generis*' (Peters, 2002, p. 38).

Perraton (2000) ends in his recent book by answering the question: "Can we make open and distance learning as good as conventional education?" with "I think it would be a good idea." (p. 200). - A good formula for asynchronous conferencing as well.

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Appendix

Table 7: Conference Stats for: Module 3

Name	Main Topics	Re-sponses	Asides	Total Msgs	Total Chars	Total Lines	Total Words	Avg Chars/Ms	Avg Lines/Ms	Avg Words/Ms
CY	0	0	3	3	2817	55	482	939	18	160
BP	1	3	2	6	11403	90	1740	1900	15	290
LS	0	3	9	12	20286	113	3314	1690	9	276
CF	0	1	2	3	1425	45	224	475	15	74
CS	0	3	2	5	8726	37	1441	1745	7	288
MN	0	0	1	1	2330	52	369	2330	52	369
JS	0	2	0	2	8370	122	1333	4185	61	666
RH	0	3	6	9	16005	304	2563	1778	33	284
RK	0	1	7	8	8497	155	1487	1062	19	185
SF	1	4	4	9	7309	76	1181	812	8	131
GB	0	1	0	1	589	21	84	589	21	84
TH(FAC)	9	4	5	18	66252	1082	9294	3680	60	516
SC	0	1	1	2	2297	7	393	1148	3	196
KS	0	0	4	4	2213	11	370	553	2	92
DF	0	5	11	16	13178	133	2303	823	8	143
YS	0	2	1	3	10370	163	1329	3456	54	443
KC	0	2	1	3	7349	20	1150	2449	6	383
MC	1	0	0	1	2724	46	390	2724	46	390
AC	0	1	0	1	1483	29	245	1483	29	245
OP(FAC)	8	2	43	53	89941	1035	13091	1697	19	247
FE	0	1	6	7	10585	56	1758	1512	8	251
PH	0	1	1	2	926	7	153	463	3	76
PW	1	3	8	12	40006	254	6205	3333	21	517
BS	0	0	2	2	1008	10	180	504	5	90
JD	0	0	0	0	0	0	0	0	0	0
AD	0	0	0	0	0	0	0	0	0	0
TC	0	0	0	0	0	0	0	0	0	0
RJ	0	0	0	0	0	0	0	0	0	0
MN	0	0	0	0	0	0	0	0	0	0
RP	0	0	0	0	0	0	0	0	0	0
LL	0	0	0	0	0	0	0	0	0	0
Totals	21	43	119	183	336089	3923	51079	1836	21	279

Figure 8: Word Count

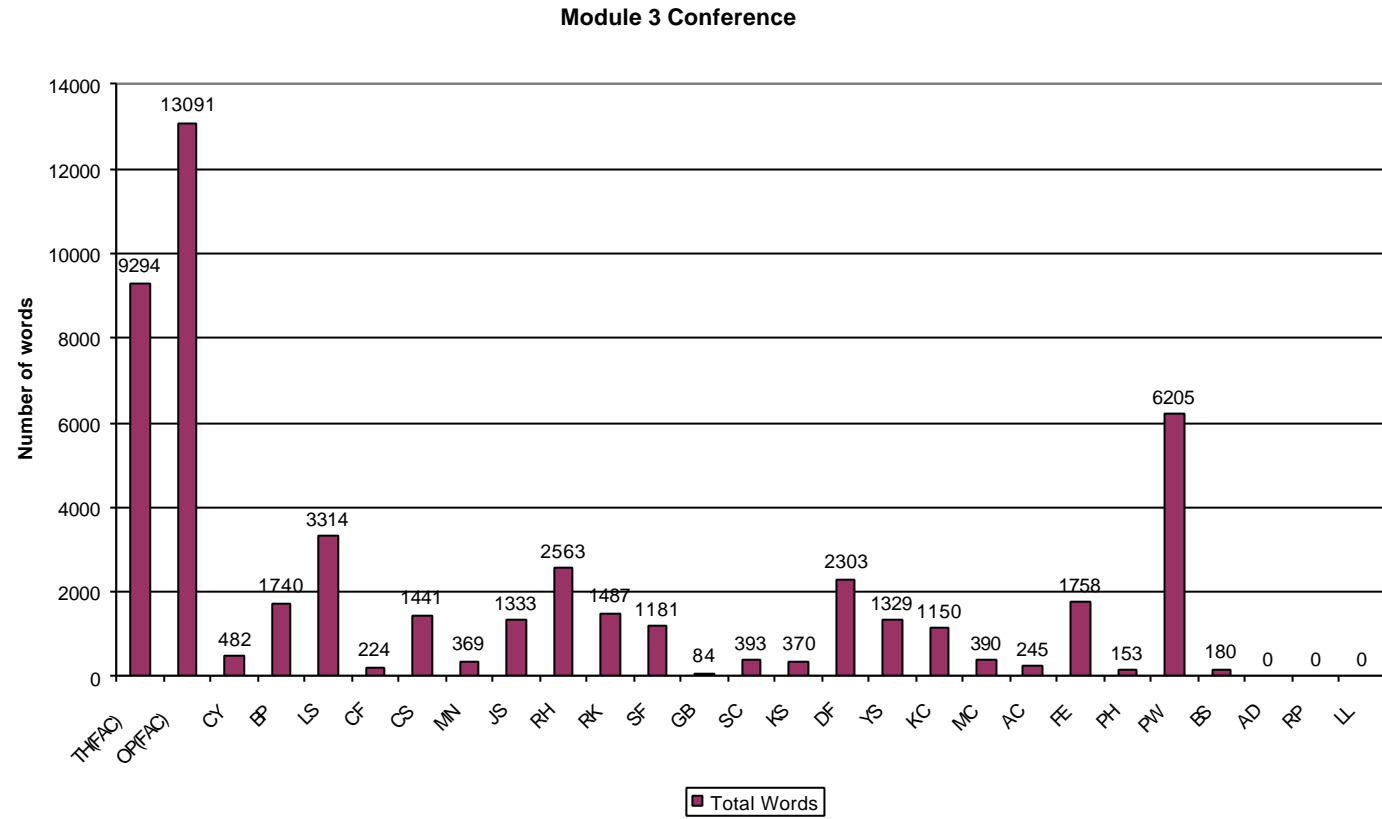


Figure 9: Message Count

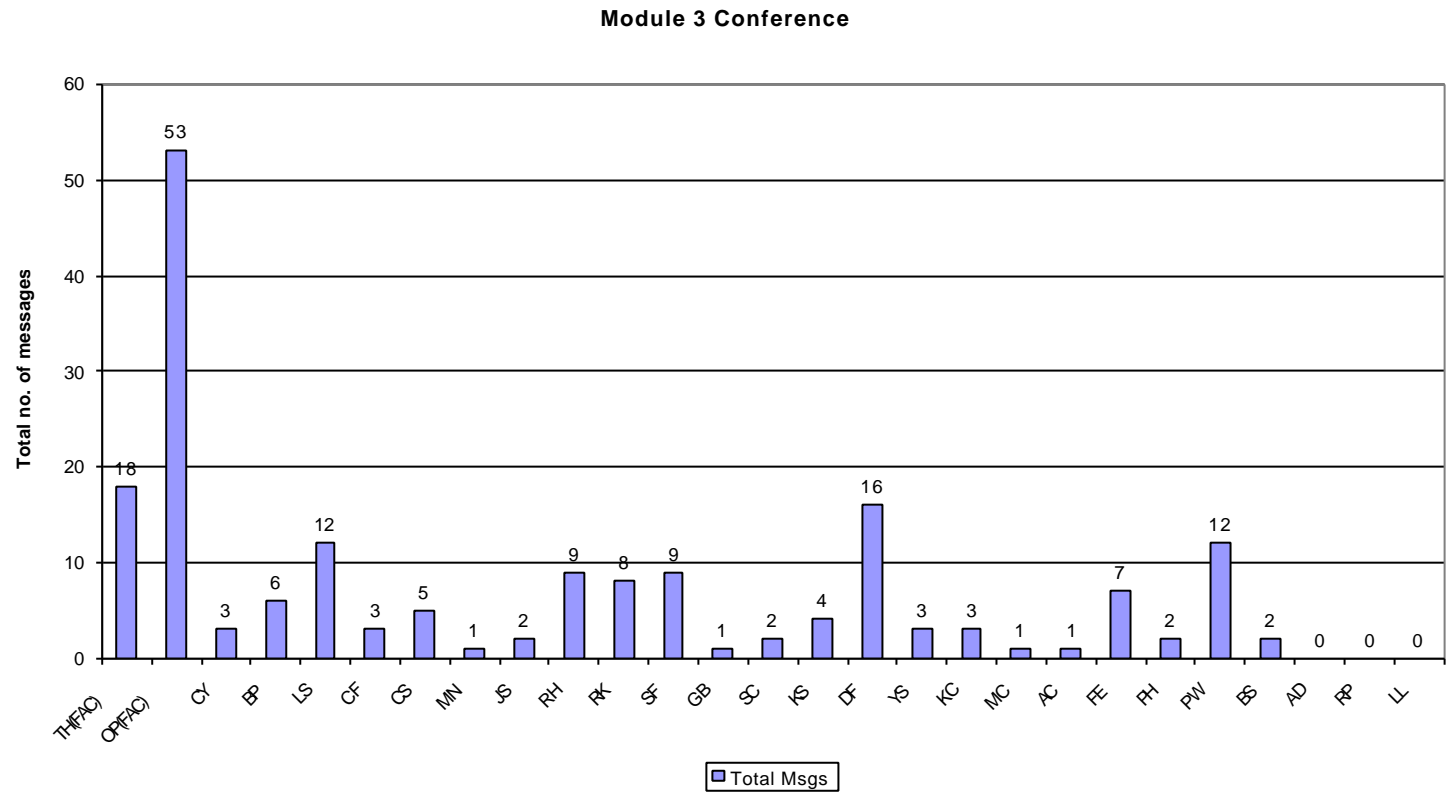


Figure 10: Average Message Length

Module 3 Conference

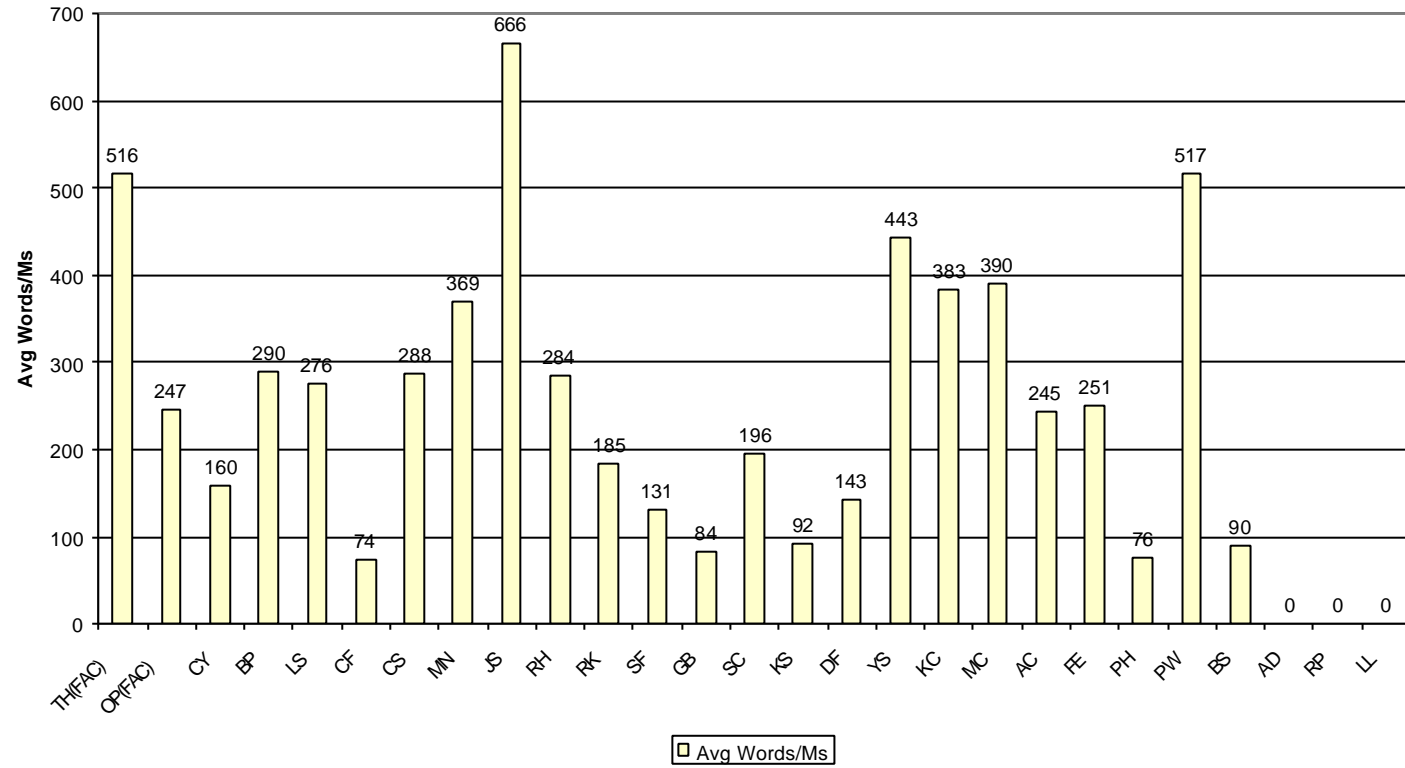
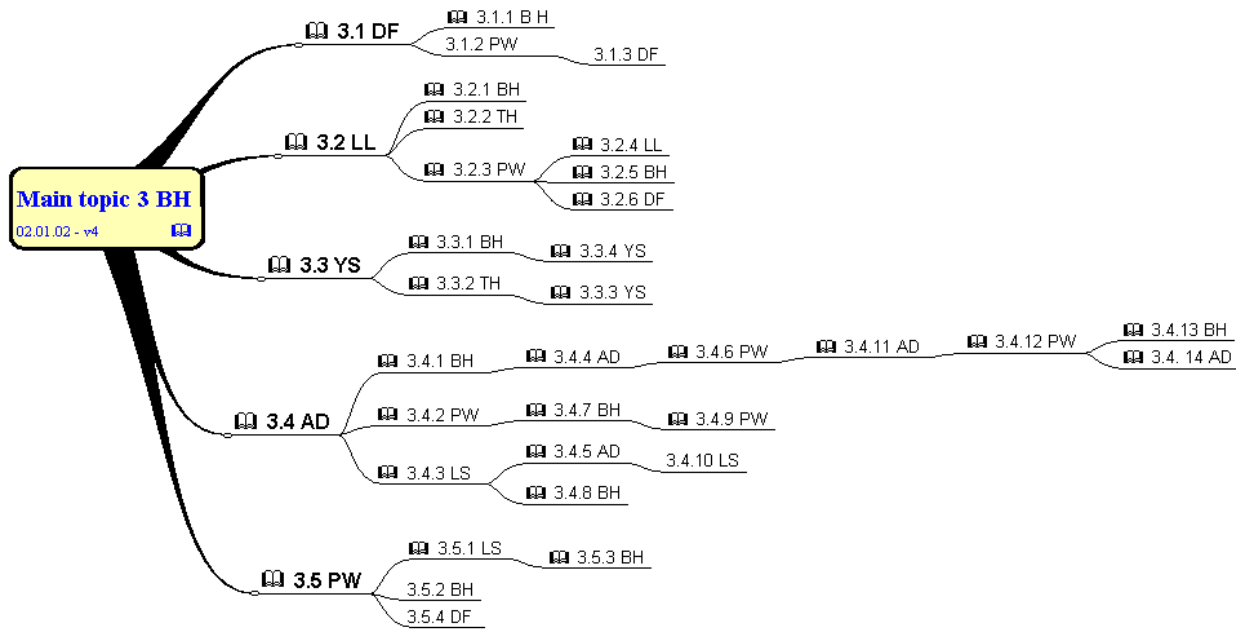


Figure 11: Conference Module 2 MT3 (Mind map threaded display)



Conference Module 2 MT3 (Mind Map Notes)

Main topic 3 BH

Lengthy introduction including the identification of the constitutive elements of distance education; Keegan's definition. Some specific readings are identified and participants invited to ask for clarification when needed.

3.1 DF

DF relates reading to his professional context. Message concentrated on context description.

3.1.1 B H

Message intended to re-set focus: we are not dealing with general issues of personnel management rather than with distance education.

3.1.2 PW

- 3.1.3 DF

3.2 LL

LL criticizes BH (and Keegan's) characterization of DE as one to one and without pacing. Does not reflect her experience.

3.2.1 BH

BH insists DE as one to one without pacing is possible.

3.2.2 TH

TH modifies: new technologies facilitate group conferencing. Groups imply pacing.

3.2.3 PW

PW joins forces with LL to criticize BH.

- 3.2.4 LL
LL admits that asynchronous conferencing unpaced and one to one is in principle possible.
- 3.2.5 BH
Repeats his point: DE unpaced and one to one is possible.
- 3.2.6 DF
DF joins with BH. Corporate world prefers individualized study before group study. Note wrong tracer number in header.

3.3 YS

YS starts to comment on BH on developing countries.

3.3.1 BH

Refers to Perraton's book.

- 3.3.4 YS
Expresses appreciation.

3.3.2 TH

Contributes references.

- 3.3.3 YS
Expresses appreciation.

3.4 AD

Relates back to definition, but does not look at individual studies and pacing, but on aspects of group activities including chat.

3.4.1 BH

Short repeat of position. DE is essentially about individual study.

- 3.4.4 AD
Discussion on group work continued. There is some evidence that peer cooperation is appreciated ("tips by PW"). But little relation to main topic 3.
- 3.4.6 PW
Aside discussion PW helping AD. Could be done as email.
- 3.4.11 AD
Continuing personal counseling on what courses to take. Veering off from topic.
- 3.4.12 PW
Veering off.
- 3.4.13 BH
In terms of content irrelevant comment. Expresses that BH is present.
- 3.4.14 AD
Final thanks for personal counseling aside of the topic.

3.4.2 PW

PW states that reading BH makes her appreciate differences. Then she comes to special issues including group work and grading collaborative work. She addresses 3.4.1 and 3.4.

3.4.7 BH

Reflects BH's stance that learning is an individual activity. But no principle sharpening up of debate between group learning and individual study (cf. Laurillard, 1993)

- 3.4.9 PW

Short rejoinder.

3.4.3 LS

LS addresses 3.4, 3.4.1, and 3.4.2. Why not chunking and attaching properly? Evidence for backslapping. The debate between individual learning and learning in a group. Could be sharper. It is clear that BH regards learning as an essentially individual activity.

3.4.5 AD

Again on group work.

- 3.4.10 LS

3.4.8 BH

Short note referring student to read 3.4.7.

3.5 PW

On terminology. PW for clarity.

3.5.1 LS

Agrees. Professional fields need some standardization.

3.5.3 BH

Agrees, but points out that practice does not comply with this desire for standardized terminology.

