UNIVERSITY OF JYVÄSKYLÄ

ON A JOURNEY TOWARDS WEB LITERACY - THE ELECTRONIC LEARNING SPACE NETRO

A Pro Gradu Thesis

by

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Tutkimus on toimintatutkimus, jonka tavoitteena on luoda osaksi Jyväskylän yliopiston kielikeskuksen kieli- ja viestintäopintoja itsenäinen elektroninen oppimisympäristö, joka tukee verkkolukutaidon kehittymistä. Tutkimuksessa raportoidaan oppimisympäristön suunnittelu-, toteutus- ja testausprosessi, sekä pohditaan kieltenopettajan haastavia rooleja suhteessa teknologiaan ja uusiin medioihin.

Tutkimus käsittelee verkkolukutaitoa sosio-konstruktiivisena ilmiönä ja lähestyy verkkolukutaitoa kansalaistaitona, joka mahdollistaa aktiivisen osallistumisen opiskeluun, työelämään ja vapaa-aikaan nyky-yhteiskunnassa. Verkkolukutaito määritellään tutkimuksessa itsenäiseksi verkon hallinnaksi, johon liitetään sekä verkkolukeminen että verkkokirjoittaminen. Verkkolukutaito jaetaan tutkimuksessa kolmeen toisiinsa kiinteästi liittyvään osa-alueeseen: (i) verkkolukutaidot ja –strategiat, (ii) verkon tuntemus multimodaalisena mediana ja (iii) metakognitiivinen tieto, eli tietoisuus itsestä (ja toisista) verkkolukijoina, joita käsitellään tutkimuksessa erillisinä näkökulmina. Verkkolukutaidon voi nähdä rakentuvan kaikkien kolmen osa-alueen varaan.

Tutkimuksessa luotu verkko-oppimisympäristö Netro (http://kielikompassi.jyu.fi/resurssikartta/netro) on avoin elektroninen oppimisympäristö ja se perustuu sosio-konstruktiiviseen oppimiskäsitykseen. Netron tavoitteena on tukea verkkolukutaidon osa-alueista verkon tuntemuksen ja metakognitiivisten tietojen kehittymistä, ja näin tukea oppijoita itsenäisessä verkon hallinnassa. Netrossa oppija tiedostuu verkosta mediana ja itsestään suhteessa tähän mediaan yhteisöllisen tiedon rakentamisen kautta.

Käytännössä oppimisympäristö Netro koostuu tietoisuutta lisäävistä pienistä verkkotehtävistä, tietopaketeista sekä keskustelupalstasta, jossa oppijalla on mahdollisuus sekä keskusteluun toisten oppijoiden kanssa että omien reflektiivisten muistiinpanojen tekemiseen. Netro-matkalla oppijat rakentavat yhdessä tietoa verkkolukutaidosta ja siihen liittyvistä osa-alueista.

Oppimisympäristö testattiin Jyväskylän yliopiston kielikeskuksessa kesällä 2003 itsenäisenä verkkokurssina. Tutkimuksessa raportoidaan kurssin vaiheet sekä kurssilta saatuja kokemuksia oppimisympäristön toiminnasta. Tutkimuksessa esitellään myös kurssin opiskelijoiden käsityksiä verkkolukutaidosta.

Verkkolukutaidon käsitettä ja toimintatutkimuksen eri vaiheita pohditaan tämän päivän kieltenopettajan haastavien roolien kautta. Netro-oppimisympäristön suunnittelua, toteutusta ja testausta lähestytään niin tukijan, kasvattajan, opettajan, oppimisen ohjaajan kuin tiimityöntekijän ja verkkosuunnittelijankin näkökulmasta.

Asiasanat: web literacy. multiliteracies. media literacy. on-line learning. e-learning. electronic learning space. socio-constructivism. collaborative knowledge building. teaching materials, methods and approaches.

CONTENTS

1. INTRODUCTION

Today's university students are faced with new learning environments and diverse social practices within these environments. The World Wide Web[1] is one of the multiple media. Technology seems to have a more prominent role in learning than ever before; more and more often students take distance courses, operate with learning platforms, apply to courses on-line and search web materials for seminar papers and essays. These new forms of social practices, as well as the vast amount of information (for information glut, see eg. Koski 1998) the web poses on us, demand new forms of reading and writing.

Using the web requires a variety of new forms of meaning making, multiple literacies. One approach to describe reading and writing on the web is the concept of Multiliteracies (The New London Group 2000)[2], which involves, for instance, cultural and linguistic diversity, multimodality and a variety of text forms, dialects and genres that are associated with the medium. In addition, the web offers its users a chance of being a member of new on-line cultures and communities on a global scale. The new social practices associated with the web are not, of course, restricted to studying and research, but are also relevant at work and other spheres of life.

We can only predict the kinds of forms of society today's students need to live and work in. Nevertheless, there is a threat of inequality when it comes to future citizenship and the capabilities to actively participate in the social practices which require multiple literacies (see eg. Castells 1996, Warschauer 1999). According to Castells (1996:371) "*the multimedia world will be populated by two essentially distinct populations: the* ***interacting***

[1] The World Wide Web is later referred to as the web.

[2] The conceptual framework of Multiliteracies being referred to in this study is the result of the work of the New London Group, an international group of specialists in education, critical literacy and discourse analysis. In this study we refer to this work by referring to the New London Group, the editors (B. Cope and M. Kalantzis) of the "Multiliteracies" article collection published in 2000, as well as the individual authors of the collection (eg. J.P. Gee, G. Kress and C. Luke).

*and the **interacted***", the distinction being in the active and critical selecting of discourses and the more passive form of accepting prepacked choices. In other words, we need to facilitate the development of critical, reflective, conscious and self-directive users of the web, rather than dependence on external instruction and authorities. Naturally these qualities are applicable to any other real-life context in addition to the web, and can be developed in all real-life situations. These generic qualities are often referred to as transferable skills and can be seen as a prerequisite for the development of who Castells calls the interacting.

Whose task is it, then, to support the use of technology and media? When offering new learning possibilities that are supported by technology, do we teachers and lecturers merely assume that the learners have the skills for using the web to begin with? Warschauer (1999:21) calls for the responsibility of educators and schooling systems to teach students to become knowledgeable users of electronic media and critical readers and writers. This is important because the nature of pedagogical practices will have an impact on who becomes the interacting and who becomes the interacted in the network society. Unless educators develop appropriate pedagogies for the new electronic media and communication technologies, it will be corporate experts, for example, software engineers, that will determine how and what people will learn, and what literacy is (Luke C. 2000:71). Naturally, it is the educators who ought to be the ones providing students with the strategies for making use of these new multimodal resources.

In Finland, these new challenges in the area of literacy and literacy pedagogy have been addressed to an extent. Already in 1995, a National Strategy for Education and Research was published by the Ministry of Education in Finland to ensure equal and high-standard basic education, as well as to make Finland one of the leading societies of know-how and knowledge. The follow up strategy published in 1999 for the years 2000-2004 (Education, Training and Research in the Information Society, 1999)

calls for the integration of media literacy in all-round education by the end of year 2004.

The aim of this study is to create an electronic learning space which supports the development of web literacy. The overall framework is socio-constructivism, which means that we want the learning space to support social modes of learning, to be more specific, collaborative knowledge building processes (Lave and Wenger 1991, Scardamalia and Bereiter 1994, 1999). The individual aim of the learning space is awareness raising (Wenden 1998, 2001), more specifically, raising awareness on aspects of web literacy. The electronic learning space Netro can be regarded as a public vehicle which takes the learners on a journey towards web literacy as reading and writing on the web.

Netro integrates web literacy into university language and communication teaching and attempts to meet the new challenges of literacy education. As the role of language teaching at the university language centre is to support university students in their studies and working life by offering them tools for managing diverse text worlds, it also follows that part of this education needs to support the students to transfer and further develop their skills to manage the web.

The present study is organised as follows. We will begin by presenting web literacy as a socio-constructive concept and by discussing the concept in the light of previous research. Based on the variety of definitions of web literacy, we will then present a model of three interrelated fields of web literacy: skills in using the web, content knowledge of the multimodal medium, and awareness of oneself as a user of that medium. This model will function as a tool for the pedagogical goals of the learning space.

In chapter 3 we will discuss our pedagogical premises which guided us in the planning and construction of the learning space. First, we will focus on learning web literacy as autonomy development and describe the cognitive processes involved in learning. Then, we will place the individual into the

social context and introduce the collaborative meaning making processes through which also web literacy can be seen to develop. Since Netro is an electronic learning space, we will also elaborate on the role of technology as a vehicle for meaning making. We will conclude the chapter by portraying how this pedagogical thinking is implemented in Netro.

Chapter 4 introduces the actual electronic learning space Netro. We will describe the context in which the learning space is developed and present its general objectives. After this, the structure of Netro is introduced in relation to the goals of the individual sections of the learning space.

A test drive of Netro took place in May 2003 in the University of Jyväskylä in Finland. The course of this optional language course is presented in chapter 5, in which we will also give the learners a voice by reporting some of their perceptions of the concept of web literacy.

We will conclude the study by discussing the possible strengths and weaknesses of the study through the diverse roles of teachers when working in the space of electronic learning. We will also make recommendations for future research as well as for those who plan to develop something similar.

2. WEB LITERACY THROUGH SOCIO-CONSTRUCTIVISM

2.1 INTRODUCTION

For some time now literacy researchers have acknowledged the fact that the Internet is becoming an integral part of people's lives. For instance, Warschauer (1999:4) states that "the most important current development affecting reading and writing is the development and spread of the Internet". New forms of literacy are required, web literacy being one of them. In this study, web literacy means, like any other form of literacy, reading and writing, using the medium of the web.

In this chapter we will present our view of the concept of web literacy in relation to a number of definitions in recent research on the areas of technology and literacies. As web literacy is a fairly new concept, there are numerous definitions and closely related and overlapping terms that describe reading and writing on the web from particular perspectives. We will begin by clarifying what is meant by the web as a medium. After that, we will have a brief overlook on the socio-constructive paradigm (Tynjälä 1999) and its effect on web literacy (Barton and Hamilton 1998, Lemke 1998). Examining web literacy through a socio-constructive framework helps us to illustrate the cultural, social, societal and historical aspects of all literacies, an in this case, web literacy. As an example of a socio-constructive approach to literacies, we will introduce a concept of Multiliteracies (The New London Group 2000), which is easily adapted to reading and writing on the web. Finally, based on research on web literacy and related research areas (Sorapure et al. 1998, Thoman 1999, Warschauer 1999, Janks 2000, Ministry of Education 2000, Karlsson 2002, Sutherland-Smith 2002), we will form a comprehensive view on what web literacy is and what kinds of areas it consists of. Through an overview of the various definitions we will finally introduce the three interrelated fields of web literacy we comprised for our pedagogical purposes.

2.2 WEB LITERACY AS A SOCIAL PRACTICE

The web is one of the new and influential technologies and media environments that surround us today. The Internet is a worldwide network of computer networks, which offers many services to its users, such as e-mail and the World Wide Web. The World Wide Web is the Internet resource that uses hypertext and handles the web pages. In the present study, we use the shorter form of this resource, the web. Web literacy, thus, refers to reading and writing connected to the web. A closely related term, Internet literacy, although sometimes used as a synonym of web literacy, thus refers to literacy connected to all of the different services of the Internet. Accordingly, the term web literacy is only related to the web and not, for example, to the e-mail.

Many recent studies on literacy have addressed the question of the social construction of literacy. For example, it has been argued that "web literacy should be understood as literacies, and furthermore as socially situated practices rather than technologically determined conventions of reading and writing" (Karlsson 2002). Literacy as a social practice means that it is always bound to the societal and social contexts of different domains of life, and is historically situated and constantly evolving. (Barton and Hamilton 1998, Warschauer 1999, The New London Group 2000). Following this view, web literacy in the present study is understood as a set of social and cultural practices of reading and writing in relation to different media objects on the web.

In order to understand what is meant by these practices of reading and writing, we will take a look at a definition of literacy practices by Barton and Hamilton (1998). According to them (1998:6-7), literacy practices refer to what people do with literacy. That is, why, how and for what purpose we read and write. Literacy practices also involve how people understand and talk about literacy and their awareness of constructions and discourses of literacy. Barton and Hamilton (1998:247-251) identify a number of literacy practices such as personal communication, private leisure or sense making. The practices, then, are realised in literacy events, various activities where literacy has a role. Examples of literacy events on the web are searching information for academic purposes, reading on-line newspapers, sending web cards, or maintaining a personal homepage. Web literacy practices, then, refer to why and how we read and write, what we want to accomplish by using the web, and how we understand the construction of information on the web. These practices are internal to individual, and affected by personal values, attitudes and feelings. What makes them social is that they are always bound to social relationships to other web users, as well as affected by the role the society puts on different literacy practices on the web.

Web literacy as a social practice is grounded on a socio-constructive view of knowledge construction. In this paradigm, individuals and communities construct knowledge. In other words, knowledge in every community and society is social, and based on shared conventions. In constructing knowledge, individuals seek this shared knowledge. Also individual literacy practices such as reading a book or using computer software can be seen as social practices, as the individual is seen as interacting with the social constructions that have affected the production of the book or the software. (Tynjälä 1999:148-149). And only through social participation the individuals internalise knowledge (Vygotsky 1978, Tynjälä 1999: 155).

The web can be seen as one large community of users from all over the world. On a macro level, this community shares the basic conventions of using the web, such as conventions of navigation, storing information and interaction. In addition, there are many sub-communities on the web, such as communities of professionals, which can be either local or global. A web user, thus, is a part of many communities, the members of which often have shared social conventions and literacy norms. By participating in the discourses of different communities, also new, perhaps less proficient members of the communities have a chance to acquire these shared conventions. Reading and writing on the web is thus a process in which the web user uses his or her prior knowledge to integrate the new information into his or her prior knowledge according to shared conventions.

If we understand web literacy as a social practice it also follows that it is historically situated and constantly changing. Changes in literacy reflect the changes in various areas of society: in personal lives, in communities, in education and in working lives. (The New London Group 2000:10-19). At least in many western societies, the web is an influential medium causing changes in literacy practices of working, public and private lives. The web functions as a new source of information demanding new strategies of handling this information, as well as brings along new ways of communicating. Reading and writing related to work and personal lives is

ever more often connected to using the web, and web literacy practices have become an integral part of society functions (see eg. Warschauer 1999:4).

At the individual level, literacy practices of a person are also influenced by his or her own history of literacy. Current literacy practices always draw on traditional ones. The way we make meanings is affected by our own life history, and our life history is affected by our literacy practices. (Barton and Hamilton 1998:12-13). Being web literate requires an understanding of how multimodal hypertexts on the web affect reading and writing practices. Although web literacy practices are different from traditional ones due to the nature of the medium, they are affected and built on traditional ways of reading and writing. On the web, it can be noticed that established practices are not always easy to change. This might be why it is not always easy to read the multilinear texts on the web, and on the other hand, why web texts often are produced in the traditional linear form without exploiting the many possibilities that the medium has to offer.

The view of web literacy as a social practice can be seen to have several implications in terms of building a learning space for Finnish university students to learn web literacy on the web. To mention a few, university studies involve more and more on-line learning and using the web. The outcome of the present study, the learning space Netro, provides students a chance to participate in real on-line learning. In Netro, the learners have the chance to become members of an on-line learning community and together construct shared knowledge through various activities of reading and writing related to the multimodal content of the web. The learners are also guided to reflect on their individual literacy practices through their own history of reading and writing, as they are encouraged to reflect on, for instance, how they read on-line and how they search information, as well as to think about how to use the information found, how to critically approach and evaluate the multiple modes of representation on the web. This way the learning space aims at supporting the development of the kind of students Castells (1996:371) calls interacting, that is, critical and knowledgeable

users of the web, who are able to adjust their reading and writing to the social conventions of reading and writing on the web.

As we have now examined web literacy as a social practice of knowledge construction, it has to be noted that web literacy is only one of the multiple literacies needed within societies, and it involves various subliteracies in itself. Many recent literacy studies use the term 'literacies' in plural, refering to multiple, different kinds of literacies needed in different contexts (see Barton and Hamilton 1998, Lemke 1998, The New London Group 2000). The different literacies are often named on the basis of the media or the symbolic systems they involve, for example, web literacy referring to literacy on the web, or visual literacy referring to images and other visual symbols. One of the many socio-constructive approaches to modern literacies is offered by The New London Group (2000) in their pedagogy of Multiliteracies. Next, we will examine the tools this approach offers to web literacy.

2.2.1 An approach to literacy as a socio-constructive practice: Multiliteracies

'Multiliteracies' is a term coined by the New London Group (2000) to refer to the different literacies of today. The concept of Multiliteracies is based on the notion of the challenges and demands literacy pedagogy is facing in the different spheres of life today: the multiplicity of communications channels and media, and cultural and linguistic diversity. As an example, mass media and multimedia texts are often combinations of textual, visual, audio and spatial elements, and how important these elements are regarded, often depend on the cultural contexts they emerge in. These elements are seen as different modes of meaning: linguistic meaning, visual meaning, audio meaning, gestural meaning, spatial meaning and the multimodal meaning, that is the various combinations of the elements above. In the pedagogy of Multiliteracies, these modes of meaning are seen as dynamic resources that users constantly remake, and as part of it, they learn to integrate many different modes of meaning-making. (Cope and Kalantzis 2000:5-7). To

describe this process of making meaning in the various contexts, and as a metalanguage of Multiliteracies, the concept of Design is introduced.

Design is a concept which refers to an idea that a person is both an inheritor of patterns and conventions of meaning while at the same time an active designer of meaning (Cope and Kalantzis 2000:5). Therefore, Multiliteracies treats any semiotic activity, like reading or writing texts, as a matter of Design. Design involves three elements: Available Designs, Designing, and The Redesigned. To begin with, Available Designs are the available resources for meaning, such as languages or other semiotic systems, and conventions associated with them, such as discourses, styles, genres, dialects and voices, as well as the way these relate to each other through intertextual chains. The next element of the meaning-making process, Designing, involves working with Available Designs and making new use of old materials. Thus, activities such as reading, listening and seeing are seen more than just a repetition of Available Designs: they always involve re-presentation and recontextualisation of them. Designing, then, reproduces and transforms given knowledge, social relations and identities in relation to the social contexts in which they occur. In Designing, meaning-makers remake themselves as well as produce new meanings and resources. The outcome, finally, is The Redesigned. The Redesigned, therefore, are based on existing historically and culturally received patterns of meaning, but at the same time, new, transformed meaning, which, eventually, become new Available Designs. (The New London Group 2000:19-23). Multiliteracies, then, can be seen as an active and dynamic meaning-making process connected to existing resources of meaning and defined by various socio-cultural aspects. The idea of meaning making as designing is illustrated in Figure 1.

Figure 1. The process of meaning making (Adapted from The New London Group 2000:19-23)

The tendencies discussed above are reflected in and through the web. On the one hand, the web seems to be one of the new media causing changes in working, public and private lives (see eg. Warschauer 1999:15, The New London Group 2000:10-19). At work, the web functions as a new source of information demanding new strategies of handling this information, as well as brings along new ways of communicating. In public and personal lives, the web functions more and more as a medium and also as a creator of different communities, cultures and discourses.

The notion of cultural and linguistic diversity is unarguably relevant on the web, since at least in principle, it is possible for many cultures and languages to flourish on the open medium. In addition, the web is a multimodal medium, where the importance of being able to integrate many modes of meaning is emphasised. The process of Design on the web, therefore, is based on many different kinds of resources for meaning making. The web contains a number of multimodal text types, styles and genres, which are organised in a hypertext form and combine many modes of representing information. That is, meaning making on the web relies on both textual and non-textual elements, as well as often on audio and spatial elements. In addition, the web comprises a number of communities of web users from various cultural and linguistic backgrounds. These elements function as Available Designs for meaning making. Reading web pages, searching for information, writing or publishing other material on the web, as well as interaction, are instances of Designing on the web. The process of

Designing is affected not only by the discourses and the social and textual norms of the web, but also by every users lifeworld experience and knowledge.

The learning space Netro is one way of applying the idea of Design to web literacy. Netro is a learning space for web literacy, a space for university students to learn about web literacy on the web. In other words, Netro provides the learners a chance to become aware of the forms of reading and writing connected to different web Designs. The vast variety of the Available Designs on the web and the possibilities of reconstructing these Designs collaboratively and openly offer the students learning possibilities that make it possible to reflect and learn, and to become active participants of the society itself. That is, Netro aims at supporting the development of web related reading and writing practices that university students, or any learners, may need when making use of this medium in their studies, in work and in other areas of life. The way the pedagogy of Multiliteracies and the idea of Design are applied in Netro is discussed in chapter 3.3.3.

In the following chapter, we will focus on the concept of web literacy in more detail. We will define the aspects of literacy as a social practice and the concept of Multiliteracies through one specific medium, the web. Based on existing research on web literacy and related research areas we will discuss the various dimensions of the concept of web literacy as it understood in the present study.

2.3 THE WEB, A MEDIUM OF MULTILITERACIES

In the previous chapter we looked at the concept of web literacy through a socio-constructive framework, and introduced the pedagogy of Multiliteracies as one socio-constructive approach to modern literacies. In order to understand what web literacy is and what it means to be web literate, we need to move on to a more concrete level. The aim of this chapter is to suggest a pedagogical definition of web literacy. This is an emergent definition and it is open for further modifications. In our definition

of web literacy our attempt is to cover a large number of aspects related to the concept, for the purpose of this definition is to support the learners' awareness raising on web literacy related issues. Our definition, thus, functions as a starting point for the journey towards autonomous managing of the web.

During the process of reading through earlier research on literacies, we came to understand the concept of web literacy through closely related research areas such as research on media literacy and critical literacy, in addition to actual research on web literacy. This is because of the following reasons. Firstly, research on media literacy addresses questions essential and applicable to web literacy, for the web is one of the many media used today. Thus, we will reflect the aspects of media literacy through one specific medium, the web. In addition, web literacy poses growing demands for critical reading skills due to the nature of the medium (see eg. Sutherland-Smith 2002:663). Therefore, research on critical literacy provides us with tools for examining the concept of web literacy from this viewpoint. Further, the existing definitions of web literacy vary a lot and offer different perspectives to literacy. In other words, it seems important to us not to choose one very narrow definition of web literacy and apply that for our purposes, but to try and integrate the aspects of various definitions and to form a wider understanding on the field of web literacy. Since the aim of the learning space Netro is to raise the learners' awareness of web literacy, it is natural to form as wide and concise definition of the concept as possible.

One model that represents various aspects related to web literacy is offered by the Ministry of Education in Finland (2000:22-23, 2001:24-25). In their report on a national literacy project, media literacy, a part of which web literacy is, is presented in the form of five steps (Figure 2).

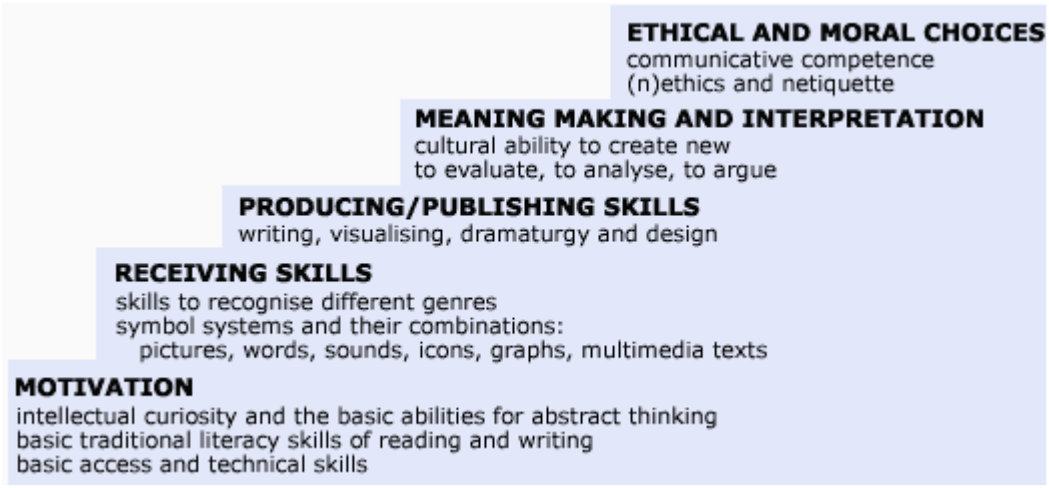

Figure 2. The Steps of (Media) Literacy
(Ministry of Education 2000, 2001:24, translated into English for the present study)

The steps describe media literacy as a multidimensional concept which includes many layers and ways of thinking. The skills connected to the process of meaning making in media environments are all important when considering web literacy. However, in order to find out what the different abilities and skills mean when the web is the medium, we need to explore, for example, what the symbol systems and genres mentioned above are on the web, and what reading and writing is like on the web. According to the report, a full competence in media literacy is achieved when a person reaches the highest step.

Another way to examine web literacy related aspects is offered by Warschauer (1999). He introduces the concept of electronic literacies, and discusses them in the light of linguistic, cultural and educational questions, as well as situates them in the social and historical context of today's world. He divides the concept of electronic literacies to hyper reading and hyper writing (1999:158-163). Hyper reading and writing are presented as two sets of skills; yet, in addition to the skill perspective, Warschauer also stresses the need for the knowledge of both visual and textual grammars needed in electronic literacies.

As the Steps of Media Literacy (see Figure 2) offer us a specific order of acquisition of skills and knowledge when developing media literacy, the

concept of electronic literacies (Warschauer 1999:21) has its focus on hyper reading and writing as meaning making as such. The two viewpoints on literacies on the web offer us valuable insight to the concept. The steps of Media literacy offer us a good starting point grounded in the Finnish society. However, as we will soon introduce in more detail, we saw it more beneficial to define web literacy along the lines of Warschauer (1999) as being comprised of various overlapping and interrelated fields, which are all equally important and function together. This framework is outlined in Table 1, in which we categorise different aspects related to web literacy in previous research. The purpose of this model is to function as a tool for managing the different definitions, and to help to conceptualise web literacy through research on web literacy, media literacy and critical literacy.

Table 1. Defining web literacy

SOURCE	SKILLS AND STRATEGIES	CONTENT KNOWLEDGE	METACOGNITIVE KNOWLEDGE
Karlsson (2002) *web literacy*	- reading - writing	- semiotic mode: multimodality - material conditions: text structures and hypertext - power and ideology - domain	
Sutherland-Smith (2002:662-665) *web literacy*	- searching and finding information - scanning information - digesting information - storing information - reading - navigating - moving, adding and changing text	- visual literacy - multimedia components - interactivity	

Ministry of Education (2000:22-23) *web literacy* *verkkolukutaito*	- browsing - navigating - recognizing - selecting - evaluation - using technology	- hypertext, hypermedia - intertextuality - multimedia: graphics, animations, sounds - non- and multilinearity - changing models of texts - interactivity - multiculturalism - netiquette	- awareness and control of one's own goals
Ministry of Education (2000:26, 2001:24-25) *Steps of (media) literacy* *Lukutaidon portaat/ Mediakielitaidon portaikko*	- communicative competence **Meaning making and interpretation:** - cultural ability to create new - evaluate - analyze - argue **Producing/publishing:** - writing - visualizing - dramaturgy - design - traditional literacy skills **Basic access:** - technical skills - abstract thinking	- (n)ethics and netiquette - recognizing genres **Symbol systems:** **-** pictures, words, sounds, icons, graphs, multimedia texts	**Motivation:** - curiosity
Janks 2000 *critical literacy*	- access - design	- domination - diversity	
Thoman (1999:50) *media literacy*	- choosing - questioning	- verbal and visual symbols - cultural and situational contextuality	- control of one's own interpretations
Warschauer (1999:158-163) *electronic literacies*	**Hypertext reading:** - finding - evaluating - making uses of sources of information - navigating **Hypertext writing:** - on-screen presentation including graphics - expressing meaning - technical skills - rhetorical skills computer-mediated communication print literacy	- grammar of text - grammar of visual design - types of genres - rhetorical structures - cultural and dialectical differences	- clear and meaningful purpose for the reading and writing activities
Sorapure et al. (1998:409-422) *web literacy*	- access - evaluation	- rhetorical situations - intertextuality - genres - multimedia - hypertext - visual and nontextual features - interactivity - netiquette	

Through exploring the different definitions and analysing them more carefully we created a framework of three interrelated fields of web literacy, in which the definitions themselves were divided into three categories of web literacy. Accordingly, we argue that web literacy is involved with areas of skills and strategies for using the web (ch 2.3.1), content knowledge of the multimodal medium (ch 2.3.2), as well as metacognitive knowledge of oneself as a web user (ch 2.3.3) (see Figure 3). We want to emphasise that this division should be regarded as a tool for understanding the many-sidedness and depth of the concept of web literacy, and not to be treated as a strict categorisation. Although the concept is perceived through these three separate fields, it is important to notice that none of them exists independently and they cannot be separated from each other. On the contrary, all of the aspects discussed are interdependent, and together form what we understand that web literacy is.

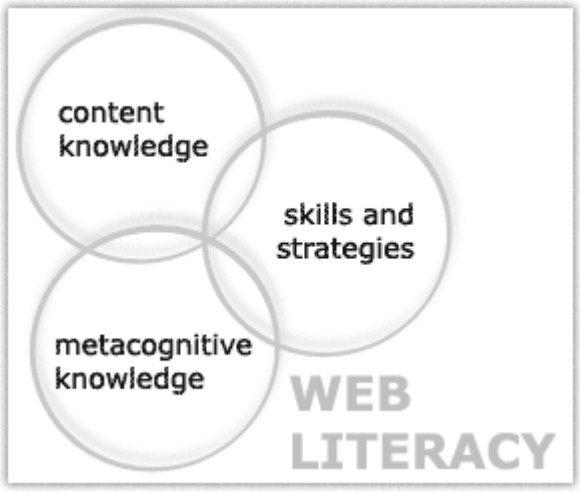

Figure 3. The three interrelated fields of web literacy

To illustrate this, we will take a look at an example of a typical activity on the web: searching information.

> *When you search information on the web, you have to know how the web is structured. That is, you know that it uses hypertext and is multilinear. You know that information may often be conveyed through images, which also may function as hyperlinks. In addition, you must also be able to browse the web, that is, you must know where to type the address of a web page and how to click the hyperlinks in order to navigate on the web. However, these alone do not yet make you a competent web reader, and it may still be difficult to find meaningful information. Thus, you must also be aware of*

> *yourself as a searcher. In other words, you must know how it is that you actually read the web pages, what your goals are, and what kind of strategies you tend to use when searching information.*

When thinking about the separate definitions in Table 1 more carefully, it is important to keep in mind that all attempts to define web literacy are context-bound and they should not be separated from the contexts of research, nor from their socio-cultural contexts, if web literacy is understood as a social practice. For instance, Janks's (2000) study on critical literacy teaching takes place in South-Africa, and the focus of her study is naturally on analysing the power relations represented in discourses, and domination of certain texts. As to definitions of web literacy, Sorapure et al. (1998) examine the concept in relation to student researchers using the web as a resource, so their natural emphasis is on assessing and evaluating the quality of information on the web. Karlsson (2002), in contrast, perceives web literacy through a study on personal homepages, and concentrates on the content and form of web sites.

Despite the variety of perspectives and contexts in which web literacy has been approached, a general tendency seems to be that the research on web and media literacy often emphasise the skills and strategies connected to the content and form of the web. This is illustrated in the Table 1, for the content of the first column of skills and strategies seems to override the other two areas of web literacy. Warschauer (1999:1), too, points out that literacy is often viewed as "skills that can be imparted to individuals". Attempts to teach web literacy, accordingly, often concentrate on providing students with detailed guidelines of what to do and how on the web. However, there are a number of reasons for a need for a shift in perspective. Firstly, the web being a dynamic, continuously developing environment, at least teaching technical skills does not in the long run support the development towards autonomous managing of the web. Secondly, the sets of skills require content knowledge, that is, knowledge on what this multimodal medium is like, how it functions and how texts in this medium are constructed. Thirdly, as we view web literacy through socio-constructive lenses, and understand reading and writing on the web as meaning making processes closely connected to the social and historical contexts, there is a

need to raise awareness on how you function as a reader and a writer, and how meanings are constructed. Finally, it is quite understandable that when raising awareness, there is a need to go beyond what you already are aware of, know, and can do. Thus, we want to shift the focus in this study from skills and strategies related to web towards the other two fields of web literacy, the content knowledge and metacognitive knowledge of the web.

In the following chapters, we will turn to discuss each of the three fields presented in Table 1 in more detail. We will first discuss the skills and strategies of reading the web and the way they are developed through Netro. Second, we will examine what the web is like as a medium, that is, the effects of the content and form of web material on reading and writing. Finally, we will address the metacognitive side of web literacy through the two other fields, and discuss how metacognitve knowledge can be gained in Netro.

2.3.1 Web literacy as skills in using the web

The various skills and strategies related to using the web in different definitions of web literacy were illustrated in the first section of Table 1 in the previous chapter (e.g. Sorapure et al. 1998, Warschauer 1999, Thoman 1999, Janks 2000, Ministry of Education 2000, Sutherland-Smith 2002, Karlsson 2002). These kinds of approaches to web literacy as sets of skills of being able to use the web may be the most accessible and understandable definition for web literacy. The concept of web literacy is often referred to by listing sets of skills related to the use of computer hardware, software and the web. Often the definitions also list more cognitive skills, which are needed on-line and take the definition to a more cognitive level. The skills and strategies approach to web literacy relates to the view of web literacy as a social practice, as many of the skills and strategies, such as storing information or navigating on the web, are based on shared conventions of web users. In this chapter we will take a closer look at these skills and strategies that a web literate person should have and introduce how this viewpoint to web literacy is presented in the learning space Netro.

In the light of the idea of Designing discussed in chapter 2.2.1, the skills and strategies refer to what one actually does with the Available Designs. At the most concrete level, this includes the basic ability to use technology, that is the hardware and software, in order to access the contents on the web. (Sorapure et al. 1998, Warschauer 1999, Ministry of Education 2000). This can refer to a simple skill of accessing the web by using a computer, for instance, switching on the computer and using the mouse to open a browser. These skills listed above do not, however, make a web literate person. Furthermore, reading on the web is characterised through browsing, navigating and scanning which are often related to the activity of searching information (see eg. Warschauer 1999, Sutherland-Smith 2002). In addition, making personal meanings from the information found requires analysing and evaluation skills, that is, an ability to make judgements about the relevance of the content for each specific purpose (see eg. Ministry of Education 2000, Sutherland-Smith 2002). Also skills and strategies such as choosing and questioning are often mentioned when defining web literacy (see Table 1: eg. Sorapure et al. 1998, Sutherland-Smith 2002, Ministry of Education 2000). For example, one may be a skilled user of web browsers or search engines but lack the skills of selecting appropriate information for one's purposes. In other words, in addition to the technical skills presented in order to manage the web, there is a need for more cognitive skills of meaning making.

Besides reading related skills, web literacy involves skills connected to writing. Writing as a part of web literacy is seen in a broad sense to refer to production of information of any kind. Warschauer (1999), for instance, calls this skill making on-screen presentations, web authoring as well as hyper writing. Thus, producing on the web often involves visualising, dramaturgy and design (Ministry of Education 2000). On the most basic level this can refer to the techniques of typing and the use of word processors. In addition, web literacy is related to such skills as storing information and moving, adding and changing text (see Table 1: Sutherland-Smith 2002:663-665) as well as producing images (see Table 1: Ministry of

Education 2000). These skills, in turn require an ability to use, for example, file transfer software for storing information on a web server, word processors for writing and editing texts, and graphics software as well as html editors.

We will not focus on this perspective of mere skills and strategies on web literacy in more detail because for our purposes it is somewhat problematic. Firstly, the aspect of change in software and hardware results in problems of continuously up-dating one's technical skills. Then again a mere skill of producing a web page does not tell us enough about what a web page actually is. Thirdly, through this kind of a skill and strategy approach to web literacy it becomes necessary to gain a lot of insight into the learners' skill levels. Thus, an attempt to teach a diverse group of students' web literacy skills tailored to support their individual needs is somewhat implausible.

Our aim in defining web literacy is in raising the learners' awareness on the concept. Therefore, it is not meaningful to once more state the obvious, that is, what has been said about web literacy as a set of skills all citizens should acquire. We argue that it is far more important to introduce aspects of web literacy that are more likely to provide new viewpoints to learners. In addition, teaching skills which can only be applied in the context of reading and writing on the web, such as using the html language to write on the web or using computer software, are not as important as are transferable skills such as knowing how texts are constructed or recognising text types, that can be applied to other media, too.

This can be achieved through changing the viewpoint from skills and strategies to what Wenden (2001:46) calls domain knowledge and metacognitive knowledge. By this we mean content knowledge of the web as a medium and knowledge of oneself as a user of this medium. We do not claim that this perspective is not present at all in earlier research, but rather argue for the importance of including these aspects of web literacy to our definition, which has a clear pedagogical goal. In other words, we need to define web literacy from all the viewpoints, yet what requires more attention

and needs to be articulated more clearly is the content and metacognitive knowledge of web literacy.

The learning space Netro can be regarded as a space in which the learners need to use many of the web literacy related skills introduced in this chapter. However, the skills are not being taught as such. We provide the learners with some strategic information for using the web, but most importantly, we direct their attention to the content of the web. In the process of the Netro journey (see ch 4.4), individual web users may develop some technical skills, too. Yet, that is a by-product of the process, even though it is probably very beneficial for that web user. Having briefly introduced the concept of web literacy as a set of skills and strategies we will now move on to the actual focus of this study, on viewing web literacy as content knowledge of the medium and later on as metacognitive knowledge of oneself as a user of that medium.

2.3.2 Web literacy as content knowledge of the multimodal medium

The second category in Table 1 in chapter 2.3 illustrated the aspects of web literacy related to content knowledge of the medium. As the previous chapter focused on skills of acting as a web user, that is, on web literacy as a social practice, this chapter examines web literacy from the viewpoint of knowledge of the web as a medium. As has already been argued, to become web literate, autonomous managing of the web requires knowledge of the characteristics of the medium itself. Thus, we will now take a closer look at what kind of a medium the web is. We will present the web through four contextual parameters related to web literacy: material conditions, semiotic mode, domain, and power and ideology (Karlsson 2002), through which various aspects of the web can be approached. In the present study, these four parameters are referred to as material conditions, multimodality, text typologies and web domains, and power and ideology (see Figure 4). Each of these parameters will be introduced and further discussed in their own sections. Our aim is again on presenting the diverse viewpoints a web reader and writer can take when focusing on the concept of web literacy.

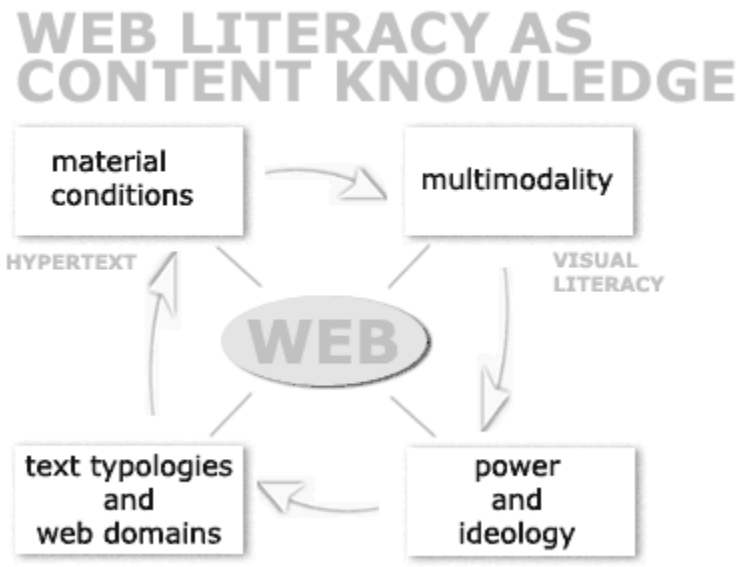

Figure 4. Web literacy as content knowledge of the multimodal medium

a. From paper to screen: material conditions of the web

The first parameter through which we will examine the nature of the web is material conditions. Material conditions refer to the technical principles and structure of storing and displaying information on the web (Karlsson 2002). In other words, the web being an electronic medium influences on the ways information is structured, which then again has an effect on reading and writing, through which meanings are constructed. Conventional reading skills are still valid and needed on the web. Yet, web poses new challenges to its readers and writers. One of these challenges is the hypertext. Cross-linked information of hypertext requires a new kind of cognitive orientation, for the web users are continuously posed with opportunities for new associations when having to create their own reading paths on-line (Luke C. 2000:72-73). It is characteristic of hypertext literacy, that each reader can decide the order of reading or browsing interconnected web pages. We will now examine how information is structured through hypertext, as well as the nature of hypertext reading.

Hypertexts can be defined as "a set of different potential texts awaiting realization". Hypertexts on the web consist of units of information connected to each other by hyperlinks. In the simplest form, this means that

a web page is connected to another page by a hyperlink. (Bolter 1998:5.) Hypertext literacy can be illustrated by contrasting it to reading traditional print texts. Becoming aware of the distinctions between these helps a web reader to identify the strategies needed in finding and evaluating information on the web.

However, as we now move on to elaborate on hypertexts, we want to emphasise that even though we contrast the conventional print texts with digital hypertexts, the distinction is not so straightforward. In fact, there are characteristics of hypertexts for example in printed newspapers, and digital texts do not always take advantage of the possibilities hypertext could offer.

To begin with, digital hypertexts can be regarded as unstable and unpredictable. Although they exist in a fairly stable form, they are easy to edit and change. Print texts, in turn, are fixed, printed on a paper and distributed to their audience. In addition, hypertexts are multi-linear, in other words, they provide their readers the chance to create their own personal reading paths. Print texts (in their usual forms) are linear and the readers can be seen more passive in the sense that the sequential form, the order of the reading, has been already decided for them. There are, of course, exceptions such as many of the Web sites that are constructed merely by copying print texts into digital form. On the other hand, newspapers and dictionaries are good examples of print texts that are more multilinear, thus the distinction is not so straightforward but more like a continuum. (Bolter 1998:5.)

Moreover, hypertexts consist of texts linked to other texts, which again may be linked to further texts. The extent of hypertext is not set. It often lacks clear boundaries and may be multi-authored. A print text, in contrast, has a beginning and an ending. (See eg. Snyder 1998:127.) This results in differences in the nature of reading. Hypertexts can be seen to be inclusive by nature, that is, all the references made through links can be reached through a singular reading process. Printed texts, in contrast, are by nature selective and exclusive, in that although they can refer to other texts,

accessing those other texts require activities outside reading. (Burbules 1998:103.) The aspect of reader choice also relates to the effect of hypertext on formation of different genres or text types on the web. Text typologies on the web are discussed in more detail in chapter 2.3.2.

Another distinctive characteristic between the digital hypertext and print text is related to the interaction between the author and the reader. If we compare a printed book to digital texts, there is a clear asymmetric relationship when it comes to the author of the book and its readers. The author of a print text seems to enjoy a higher status when the readers can relate to the linear and fixed text. The text has been written and most likely edited several times before publishing and distributing it to stores where it can be purchased. Editing an existing print text is impossible (Bolter 1998:6). Electronic texts, in turn, are retrieved on-line and changing them is easier, less expensive and the questions of plagiarism are more present. The reader can more easily copy and edit the text on-line. Hypertext readers also make their own connections and follow the paths they select from those provided by the author. This can be seen as blurring the boundaries between authors and readers, too (Snyder 1998:127). Bolter (1998:4-6) calls the relationship between hypertext authors and readers a more egalitarian one, for there is a collaborative aspect involved. By this he refers to the possibility of contacting the author more easily and affecting the text content. In fact, both writing and reading on the web are based on this assumed interaction.

As the reader of a hypertext creates his/her own reading experience by following links, two aspects are important to consider. First, all links are not the same in nature, and second, every link has a purpose. Burbules (1998:103-106, 110-117) argues that links differ in their type of semic relation. This means the associative relations of information and associations that readers make when interpreting the nature the link implies. Links are like tools of rhetoric. For example, they have a metonymic relationship, like in cases where certain icons always function as certain links, for instance by clicking the image of a letter you most often open a

web based e-mail software (for more on iconic relationships, see ch 2.3.2). When two pieces of information are linked together, it implies that they relate to each other in some way.

Thus, as Burbules (1998:110-111) argues, a critical hyperreader must consider why a particular link is made, which values it implies, and how appropriate and relevant these associations and values are for the reader. Although the readers may construct their own texts through following certain paths of hyperlinks, the initial point they begin their path from is created by someone for some reason and motivation. In other words, critical hypertext literacy is not just using links, but also being aware of their purposes.

As we have now introduced some of the characteristics of the web through the parameter of material conditions of the web, it is important to relate this content knowledge more carefully to the concept of web literacy. Electronic texts force the readers to become more active because of the continuous choices that the multilinear, multiauthored hypertexts offer. The choices of a web literate person should, of course, be conscious, goal-oriented and dependent on the purpose of reading, for it is literally possible to get lost on the web. The hypertext structure also challenges the reader to search the information and requires effective skimming and scanning techniques, in addition to the critical assessing of the web content itself. The web structure of hypertexts can also be seen as a skill transferable outside the web. As Sorapure et al. (1998:420) point out, "[d]iscussing how and why links link can help us understand not only the value of the web site, but also how ideas can connect, coordinate, and subordinate in any writing". Meaning making requires these kinds of active processing of information and linking scattered pieces of information together with various associations. This mental process becomes visual on the web, as all the readers and writers on web construct their reading paths. Thus, through knowledge about hypertext reading and writing, it is possible to learn about meaning making and manage the info-glut already discussed in chapter 1.

This awareness of the way in which the technology of hypertext makes meaning construction partly visible is one of the most significant aspects of web literacy. As an electronic medium, the web also enables the hypertext to be constructed of several modes of meaning. This aspect of semiotic mode on the web is the next web parameter discussed in the scope of this chapter.

b. Multimodality and the role of visual literacy on the web

Multimodality is one of the most significant aspects of meaning making especially on the web. The web enables to make use of a variety of modes of meaning. It not only becomes possible to use a larger variety of modes, but it is cheaper and easier to construct digital texts, which in addition to their hypertext structure make use of, for instance, elements of written language, colours, visual images, animations, sound and their combinations. According to the Multiliteracies pedagogy (The New London Group 2000:25-30), there are six Design elements involved in meaning making. These are Lingusitic, Visual, Gestural, Spatial, Audio, and Multimodal Design, which connects the other Design elements. Kress (1998:57) points out that the users of multimodal materials are assumed to be competent in all modes of representation. Thus, knowledge on how information is presented in different modes, and an ability to interpret and make meaning of the multimodal content of the web, is a natural part of web literacy, too.

Multimodality is not a new phenomenon. Written and visual elements have coexisted already in print forming multimodal texts. However, until recently, writing has been the dominant mode of representing information. (Bolter 1998:8, Kress 1998:62-63.) Relevant and important information has been provided in written form, and images and other visual element have been used as illustrations or decorations. Now, this relation of the verbal and visual has changed, and Kress (1998:66, 2000:183) uses the term visualisation to describe this change. Visualisation refers to the fact that information in written form is 'translated' into the visual form, as the visual mode is seen to be a more effective way of transporting information. Once

again, this is important on the context of the web for various reasons. For instance, the amount of information on-line is huge. The ease of digital image manipulation, combining text and images, and web publishing has resulted in the web being very visual in nature. On the web, visual aspects are emphasised also in the written texts, the possibilities of font-types and size, colours, and layout being so many. Since the amount of information on the web is so vast, as mentioned before, reading on the web is often merely skimming or scanning. Even the web browsers used in accessing information on the web are visual in nature. According to Kress (1998:70-72), the visual mode is likely to dominate on the screen, as the screen itself is a new space of representation. In consequence, our focus is on the visual mode. We do not claim that the verbal mode is not significant, but in the scope of this study, we feel the need to integrate visual literacy into web literacy and want to combine the visual mode with the verbal one.

Visual literacy on the web is connected the notion of hypertext discussed in the previous chapter. Since images or parts of images often function as hyperlinks, they have become unstable and arbitrary symbols. This has an effect on reading. Every image or other graphic element on a web page is a potential hyperlink, which is part of the whole construction of a text. (Bolter 1998:8.) Thus, as Bolter (1998:4) notes, "reading web pages requires an appreciation of the graphics themselves and the relation between graphics and text."

Visual literacy can be examined through the framework of visual social semiotics. Semiotics is study of signs. In semiotics, signs refer to expression or representation that manifests a meaning or content. Furthermore, signs exist in semiotic systems, examples of which are language or imagery. (Harrison 2003:47-48.) Social semiotics, in turn, is a field of semiotics that is interested in how people use signs, how they produce and communicate meaning through signs in different social settings (Kress and van Leeuwen 1996:264). According to Jewitt and Oyama (2001:136), visual social semiotics involves "the description of semiotic resources, what can be said and done with images (and other visual means of communication) and how

the things people say and do with images can be interpreted". Thus, understanding signs used on the web can be considered important in web literacy.

Visual social semiotics provides web users many useful tools for analysing and interpreting visual elements on the web. To begin with, as Harrison (2003:49-50) notes, visual social semiotics involves knowledge of three categories of images. These are the icon, the index and the symbol. Representatives of all three can easily be found on the web. First, an icon is an image that is similar or resembles an object or a person as it is conceived in reality. For example, an image of fire is an icon of fire in reality. An example of an icon on the web is image of a house representing a home page. Second, an image is an index if its relationship to the concept it represents is understood. Smoke, for instance, is considered an index of fire. On the web, in turn, an arrow indicating a link to the top of the page is an index. Since an index is not recognisable based on similarity, a reader has to be aware of its function. That is, a web user has to recognise the relationship between the arrow and the link to the top of the page. Finally, a symbol is an image the meaning of which is based on convention, and has no visual or conceptual connection to the object it refers to. In other words, the meaning of a symbol has to be learned. Symbols found on the web are, for example, lines beneath words to indicate that the word is a link. (See also Hammerlich and Harrison 2002:140-142.)

Since icons, indexes and symbols are very common on the web, it is important for a web reader to be able to interpret them and understand their function. Navigating and reading web texts rely on these signs that are conventional in the community of web users. In addition, however, visual literacy involves the ability to analyse all kinds of visual elements, including more complex images. Kress and van Leeuwen (1996:40-42) present a social semiotic framework for analysing images that is well applicable to the web. Similarly to language as a semiotic system, images have specific functions in creating meaning. According to Kress and van Leeuwen (1996:40-42), the three metafunctions of images in creating meaning are the

ideational, the interpersonal, and the textual metafunction. The first, the ideational metafunction, refers to how objects are represented in the image, and how they relate to each other. The second, the interpersonal metafunction, refers to the relationship between the producer and the receiver of an image. In other words, it refers to the way in which the image engages the viewer. Finally, the textual metafunction refers to the composition of an image. This includes, for example, the layout of the image, that is, the information value and the salience of the image. Together, the metafunctions create the visual meaning for the readers. (See also Harrison 2003.)

If a web page is seen as one visual image constructed of elements of different modes, the textual metafunction becomes of particular importance on the web. This is because the layout, composition and information value of the different elements of the page have an effect on how the page is read. Kress and van Leeuwen (1996:181-211) identify four parts of visual space, each of which has a regular information role: left, right, bottom and top. According to them, the left side of an image has the value of being 'given' or familiar, whereas the right presents 'new' information. Furthermore, the top of an image is considered as 'ideal' information, while the bottom section has the role of 'real' information. (See also Kress 2000:200-202.) This division of layout can also be applied to web pages. For example, the static navigation bar of a page is often situated on the left, representing familiar information. New or current information such as a notice board, in turn, is often situated towards the right. Similarly, 'real' information like information of copyright and authors are usually presented at the bottom of the page. Naturally this is not always the case. However, since a page is often loaded with a large amount of multimodal information, this model of the visual space may provide the web reader useful clues of where on the page to find particular kind of information.

It is important to notice that the framework by Kress and van Leeuwen is based on analysing images in Western cultures where reading proceeds from left to right. Applying this kind of analysis on the web, we have to keep in

mind that the web is a global and multicultural medium. As Kress (1998:57) points out, the visual is not a neutral mode, but as culturally bound as the verbal mode. The question of cultural diversity and dominance on the web will be discussed in chapter 2.3.2.

Before that, however, we will discuss texts on the web. We have already noted that information on the web is presented in many modes and organised and structured by hypertext. The result is a wide range of various kinds of texts. Finding and evaluating these texts require identifying different text types. In the following chapter we will discuss different approaches to identifying text typologies on the web.

c. Text typologies and web domains

Since the web is a new medium, it still lacks established writing conventions and genres. Sorapure et al. (1998:410) note that web readers encounter many different rhetorical situations, different kinds of texts, for which the web in itself does not offer much classification or categorisation. However, reading, analysing, evaluating and interpreting information requires knowledge about the different types of texts a reader may encounter on the web. Thus, we need to address the third contextual parameter on the web, that of text typologies. In other words, we will try to find out whether it is possible to distinguish different text types on the web, and what their relevance is to web literacy.

To conceptualise the world people have the tendency and the need to categorise its phenomena. When thinking about literacy as such, text types have been categorised in various ways and their characteristics have been described. One of these traditional classifications is presented by Werlich (1983:39-41). He classifies texts into five text types based on the contextual focus of the text. The categories are described in the following way:

> "*Description* is the type of textual communication in which the encoder [...] deals with factual *phenomena in space*. It is the text type related to the cognitive process of *perception in space*."

> "*Narration* is the type of textual communication in which the encoder [...] deals with factual and/or conceptual *phenomena in time*. It is the text type related to the cognitive process of *perception in time*."
>
> "*Exposition* is the type of textual communication, which the encoder chooses for presenting either constituent elements, which can be synthesized into a composite concept (manifested in a 'term') or a mental construct (manifested in a 'text'), or those constituent elements into which concepts or mental constructs of phenomena can be analysed. The encoder thus explains how the component elements interrelate into a meaningful whole. This text type is related to the cognitive process of *comprehension*."
>
> "*Argumentation* is the type of textual communication in which the encoder proposes relations between concepts of phenomena. The encoder makes his propositions in explicit or implicit opposition to deviant or alternative propositions. Argumentation is the text t type is related to the cognitive process of *judging* in answer to a problem."
>
> "*Instruction* is the type of textual communication in which the encoder tells himself [...] or others [...] what to do. This text type is related to the cognitive process of *planning*."

Each of Werlich's text types introduced above can be found on the web. As noted in the previous chapters, however, the multimodal, hypertextual and interactive nature of the web results in texts different from conventional print texts. Rather than representing any single text type Werlich presents, web texts can often be seen as combinations of the different types. For example, an argumentative essay can be connected to a page containing the writer's career history by a hyperlink, and the text can be seen as a combination of argumentation and narration. Furthermore, interactive web texts such as chat rooms and whiteboards may be combinations of any of the text types depending on each usage, and do not fit to any of Werlich's text types. Thus, there is a need to find new and perhaps broader categories for identifying web texts.

There are many suggestions for text categories focusing on web texts. For example, Kamil and Lane (1998:332) divide web texts into three: primarily narrative, primarily expository and completely graphical. They argue that most texts encountered on the web are expository. Their categories resemble the hypermedia genres presented by Eagleton (2002). She, too, presents the categories of narrative and expository, and adds the category of communicative, which includes, for example, on-line games, live chats and e-mail. Eagleton's categories, however, do not address web content as such, but are cases of Internet literacy, for they contain the element of e-mail,

which is not a part of the web (see ch 2.2 for the definitions of the web and the Internet). Nevertheless, in contrast to Werlich's classification, both of these two categorisations take notice of the multimodal and communicative aspects that are central in web texts. In addition, they acknowledge the fact that web texts may include aspects of many different types of texts, being only primarily of some type. This characteristic may well be typical for many current print texts, too. However, some problems arise also in these classifications. First, the class of purely graphic texts only focuses on the mode of the text, but ignores what is more important, the content of the text. Furthermore, communicative aspects can surely be found in the other text types besides the communicative. For example, electronic magazines, although considered expository, often include discussion forums or other possibilities for communication.

It seems that web texts are difficult to divide into strict categories, and none of the classifications of web text or web genres discussed above seem to fully describe the diversity of text forms on the web. Therefore, a useful way of approaching web texts is to examine them through a set of continuums. By this we mean that each text on the web is comprised of a set of continuums related to the text production and usage, rather than representing any particular text type (see Figure 5). Also Karlsson (2002) presents a set of continuums related to writing and reading conventions in different web domains, in other words, different areas of web content. Web texts can be considered public or private, local or global, and non-professional or professional. Karlsson discusses these domains in relation to her study of personal homepages, and does not define the continuums beyond this focus. However, her approach can well be applied also in other web texts. With the help of these ideas we wish to provide web readers an additional viewpoint to cope with the multiplicity of text forms on the web. Thus, we will next elaborate on the continuum approach and discuss how web texts can be looked at through each of the domain continuums.

Figure 5. Web continuums

First, the local-global continuum refers to the intended audience of the text. Although the web is a global medium, many texts are targeted to a certain group of readers. Karlsson (2002) notes that, for example, the use of personal homepages usually is rather local than global, in that there is a certain community of those who visit the pages. However, any web user can be seen as at least a potential international author (Warschauer 1999:7). The target audience of a web text depends naturally on the language choices of the content. Using the English language naturally results in the target audience becoming more international; then again, a choice of a minority language may restrict the audience to a more local level. The content of the text may also vary in its level of detail, which may also be interpreted as a more local or global characteristic of a text.

Second, the public-private continuum addresses the question of whether a web text is a kind of private form of writing, or a public mass media text. Again, Karlsson (2002) sees personal homepages more public than private, although they often contain, for example, journals and other modes of writing traditionally considered as confessional. The fact that the web is a medium that, at least in principle, makes everything public, does not mean that every writer aims at a public audience. The relevance of the private-public continuum for a web reader, thus, is to consider whether the text in fact is meant to be public or private, and what the relevance of the information thus is.

Third, the non-professional-professional continuum has many dimensions. First, it can be examined in terms of the professional skills of the author both in the contents of the text and the design of the web page. For instance,

professionalism on the content refers to the writer's expertise on the subject matter and can be presented in the text in various ways. It can be even inferred from the URL address of the web page or, then again, from merely acknowledging the author's background as an expert on a specific field. Professionalism on-line can also be faked, and critical reading skills are needed when assessing the web content. Not always does a technically professional third generation web page contain valid nor reliable information. On the other hand, web content may be very linear and poorly presented but still be highly professional in terms of the information. Second, the continuum refers to the use of the page, that is, whether it is used for professional purposes. For example, even a personal homepage can at times be regarded as professional, for the page may be used for research purposes and thus, be of professional use. Then again, organisations can also have so-called non-professional web sites, for not all the content is meant for institutional purposes (eg. games, cafes etc.).

In addition to the three continuums, we suggest that a fourth continuum can be applied relating to hypertext. This is the continuum between restrictive and open (Snyder 1998:128). At the one end, a restrictive text is like a linear version with few navigational choices. At the other end, a text has multiple navigational choices. By focusing on the web content through this continuum the reader can focus on the hypertext characteristics of the web already presented when introducing the parameter of material conditions.

To sum up, instead of trying to divide web content into strict categories we suggest that the web can be understood as consisting of various domains, each of which can be examined through four continuums. The continuums help the reader to consider the purpose of the text and its target audience, which, in turn, helps in evaluating the relevance of the text to the reader. Through this process of thinking about the web content the reader can make conscious decisions and critically choose valid information from the flood of information on the web. The continuum thinking may also have an effect on the sense of control the web reader has over web content. And as open continuums that are not too strict and allow the medium and its content to

change, the web continuums also support the dynamic, life-long nature of the meaning making processes. In other words, it may support managing the change.

Focusing on each of the four continuums also includes an aspect of critical literacy, for they can be used as tools with which the web reader can operate when thinking about the purpose, the target audience or the author of the text. It is important to keep in mind that also the choices of modes and structure of texts reflect the goal of the author. These thoughts lead us to the fourth and the last parameter of the web discussed in the scope of this study: the role of power and ideology on the web.

d. Power and ideology on the web

The fourth parameter of power and ideology can be regarded as content knowledge of the web when thinking about critical orientation to the content of the medium. The question of power and ideology is relevant both for examining individual web texts, as well as the medium as a whole. In other words, a web reader faces the questions of who has power on the web, and whether the web is a medium where certain ideologies dominate. In addition, multimodality and the ease of web authoring set demands for evaluation of web texts. Thus, in this section we will first take a look at "who owns the web", that is, the power relations and dominating ideologies on the medium, and then focus on issues of how to critically approach the web.

The issue of power and ideology on the web can be examined, for instance, through Janks's (2000) four-dimensional frame on teaching critical literacy. She presents critical literacy as consisting of four conceptualisations, the focus of which are interdependent, yet one is always more dominant than the others. In other words, one conceptualisation is always on the foreground at the expense of the other three. These four conceptualisations are those of domination, access, diversity and design. Let us now elaborate

on these four conceptualisations and see how they can be adapted to critical literacy on the web.

According to Janks (2000), domination focuses on the question of "who is empowered or disempowered by the language used". Access, then again, focuses on the problems of choosing the texts and discourses to be worked with and the problematic balance between mainstream discourses and more marginalised discourses. The third conceptualisation, diversity, focuses on the variety of different discourses and the possible positive outcomes of being faced with these different discourses. The last of the four, design, refers to the ideas of the New London Group (2000) of meaning making as Designing, which has already been discussed in chapter 2.2.1 and will not be examined here in more detail.

As to web literacy, all of the above conceptualisations are relevant. Domination in the scope of the web is very present, yet not often questioned. Burbules (1998:119) notes that "like any other medium, the web advantages certain voices and perspectives and disadvantages others". This means that certain cultures, languages and ideologies are clearly more present than others on the web. The web is dominated by wealthy well-educated elite and most of the content is shaped in the U.S. (Warschauer 1999:17). Thus, the web is still very much a medium of the Western industrialised world, and as such, empowers the Western worlds' citizens (see eg. Warschauer 1999:172-176). Dominance is also present in the form of the English language being the language of the web and disempowering those lacking adequate language skills (see eg. Warschauer 1999:169-171). However, researchers have remarked that the dominance of the English language, as well as the Western world altogether, may not stay as strong as it is at the moment. For example, the traditions of visual design outside Europe have already become important aspects on the web and more and more members of on-line communities come from non-Western cultures (Lemke 1998:292-293).

Access can also be viewed from a number of perspectives. The web can be seen as a democratic medium, for the possibilities it offers for multicultural publishing. The web readers are faced with an access to a diverse multicultural and international web content. Access can also be understood as the web offering an access to various discourses, for the web not only is a forum of the mainstream discourses, but also the forum for marginalised discourses and subcultural views. For instance, in what other medium can subcultures and small communities publish their thoughts, contact each other and strengthen their social practices? The amount of information accessible to all web users is vast. However, we cannot claim that the web is equal. Access depends on the costs of hardware and software and on the ability to use the web, and it has been researched that gender, wealth and country of origin skew the use of the web (Warschauer 1999:17). Furthermore, Warschauer (1999:167) states that "oppressive governments around the world fear allowing their citizens unfettered access to the Internet". The web could support cultural pluralism, yet, it would require "marginal groups gaining equal access to shape" the web content (Warschauer 1999:20).

Diversity, in turn, presents itself in the various forms of discourse, in the variety of languages, cultures and modes of meanings present on-line. If Kress's (1995 in Janks 2000) idea on including diversity into teaching helps students to deal with and adapt to the ongoing changes in society, isn't the web a valuable source of diverse discourses accessible to students? Access to diverse forms texts and discourses is certainly an advantage, but at the same time, it requires a lot from the web users. When discussing reading and writing on the web, it is important to consider how the reader can cope with this diversity that reflects power relations and ideologies.

Research on web literacy, as well as all critical literacy, emphasises the importance of analysing, evaluating, assessing the content on the web (see Table 1). What makes the evaluation process especially important on the web, and also different in contrast to traditional print texts, is the fact that in principle, whoever qualifies as a writer on the web. Traditionally, certain

institutions such as publishing houses or the press have determined and decided what is published and by whom. The web, in contrast, is a publishing space for anyone to publish any kind of information. As Karlsson (2002) notes, the web is a medium where traditional power relations and roles of the media have changed. This means that more responsibility is left for readers to determine the value of information for their purposes.

Thus, critical reading of the web has to do with asking questions about the text's purpose, authors and target audience. As was already noted in chapter 2.3.2 when discussing hypertext reading, all texts are written by someone for some purpose. Authorial expertise and the purpose of the text can be evaluated in terms of objectivity, coverage and writing style, which tell a lot about the values, ideologies and bias it implies, as well as the reliability of the source. However, these kinds of traditional evaluation criteria may be problematic on the web. For example, web sites often lack information about the authors or publication dates, and coverage and reliability may have to be traced and evaluated through wide amount information connected by hyperlinks. (Sorapure et al. 1998:413-416.)

Keeping these problems in mind, Luke A. (2000:453) presents an approach on teaching critical reading that is well applied on the web. He proposes that students should be taught "to read backwards from texts to the context of their social construction […] and to write forwards from the texts to their social use, interpretation and analysis". This means that texts need to be analysed as to their social construction, as well as to the various contextual interpretations of the possible reconstructed texts and discourses. Luke A. (2000:455) points out that conventional approaches to critical reading often focus on, for instance, identifying bias in texts. However, a more fruitful approach might be to simply ask "what a text is trying to do to me". That is, focusing attention to who could have written or read a text leads the reader to question the context in which the text is produced and the context in which it is or is meant to be read. This is without doubt a good starting point to manage the diversity of texts and discourses on the web.

In the context of the Finnish society, the question of access and domination may not seem as relevant as, for example, in the context of Janks's (2000) study in South Africa. However, not everyone even in Finland has access to the web or the ability to approach the medium critically. Thus, we feel that a web literate person, from any background, needs to be aware of both the ideologies and power relations that dominate the web, as well as the diversity of ideologies that can be found on the medium. In addition, access to this diversity of discourses and texts requires an ability to adjust traditional evaluation strategies to web context, in order to be able to reconstruct them according to one's own purposes.

To sum up, we have now introduced the web as a medium through four contextual parameters. We still need to examine what kinds of implications this content knowledge approach to web literacy has for the actual learning space.

Firstly, this approach gives an easy access to the medium, in other words, by viewing web literacy through the content knowledge perspective in Netro, we can overcome the problems of focusing on the skills and introduce the medium as such. For it is naturally easier to ask the learners to read and reflect on some topic than to ask them to master it in practice. For this reason, the content knowledge approach gives us an opportunity to give the learners an access to several web literacy related topics instead of focusing on one or two specific skills.

Secondly, by introducing web literacy through content knowledge of the web we can also ensure that the target audience, the learners, are more likely to broaden their conceptions on what web literacy is and to become aware of the many-sidedness of the concept. For we argue that knowing the medium enables the learners to engage in social practices within that medium.

Thirdly, in the beginning of this study we introduced Castells's (1996:371) idea of the interacted and the interacting. As to the content knowledge approach to web literacy, in the case of the web, we argue that it is those

who know the medium and the social practices it entails, who will become the interacting. In other words, only after getting to know the medium you can begin to learn to function in it more properly.

Thus, each of the four parameters is presented in the learning space (for a detailed description of the structure of Netro, see ch 4). For instance, the different aspects of material conditions, multimodality, text typologies and web domains, as well as power and ideology on the web are presented through separate introductory sections to each topic. In addition, there is a chance to learn more about these topics from given references and suggested web links. The learners also encounter tasks related to on-line reading and hypertext, multimodality and different aspects of visual literacy, analysing web texts in terms of text types and web domains, as well as the question of cultural and language issues and the question of power and ideology on the web.

To conclude, in the different sections of Netro the learners' attention is directed to the various contextual features of the medium, and they are challenged to reflect on the topics through various activities. In addition to providing content knowledge, however, the learning space also aims at supporting the building of metacognitive knowledge, that is, knowledge of oneself in relation to the content knowledge. Thus, we will next turn on to discuss the third field of web literacy, that is, to web literacy as awareness of oneself as a web user.

2.3.3. Web literacy as awareness of oneself as a web user

We began exploring the concept of web literacy by introducing web literacy first as a set of skills and strategies (ch 2.3.1) and then, as content knowledge of the web (ch 2.3.2). The third viewpoint on web literacy has not been that clearly articulated in the definitions on web literacy in earlier research and is that clearly referred to only in few of the definitions in Table 1 in chapter 2.3 (Thoman 1999, Warschauer 1999, Ministry of Education 2000). This is web literacy as metacognitive knowledge.

By metacognition we refer to an awareness of one's own (and others') cognitive processes, thinking, learning and knowing (Tynjälä 1999:114-115). As content knowledge (see ch 2.3.2) is knowledge of the specific domain, in this case knowledge of the medium web, metacognitive knowledge is knowledge about oneself in relation to the content knowledge. Metacognitive knowledge can be divided into three areas: those of person, task and strategy related knowledge (see eg. Tynjälä 1999:114-115, Wenden 1998 in Benson 2001:95-98, Wenden 2001:45-46). We discuss metacognition more carefully in chapter 3.2.2 where the focus is on building one's metacognitive skills. In this chapter we merely focus on how metacognitive knowledge can be understood as a crucial part of web literacy, and describe the three areas of metacognitive knowledge in relation to the web (see Figure 6).

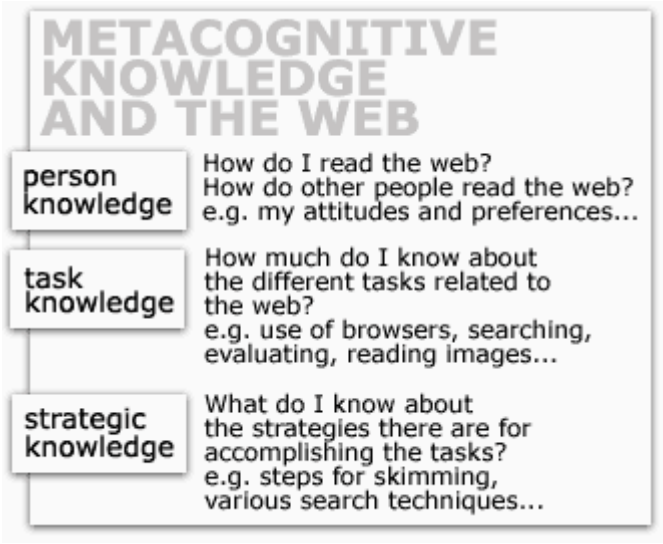

Figure 6. Metacognitive knowledge and the web.

Firstly, person knowledge on web literacy can be understood as knowledge the web reader has acquired about how cognitive and affective factors may influence his/her reading and writing on the web, and how these factors apply in their experience. Person knowledge also refers to how proficient the readers and writers see themselves on a given area of web literacy.

This kind of person knowledge is probably included in many of the definitions of web literacy introduced earlier, yet it has not been articulated

that clearly. What has been referred to is control of one's own interpretations (see Table 1: Thoman 1999). The web reader should be aware of the ways s/he interprets web information, which naturally requires person knowledge. The questions of what motivates the reader, and on a larger scale, the personality of the reader, are also addressed in the Steps of Media Literacy introduced in chapter 2.3. In addition, what is also mentioned is the knowledge of oneself as a web reader, in other words, a proficient web reader and writer is aware of his/her reading strategies. (Ministry of Education 2000.) Warschauer's (1999:163) comment on the need for "a clear and meaningful purpose for reading and writing" can also be interpreted as person knowledge. In the context of the web, knowing oneself can naturally help a web reader. If you know your strengths and weaknesses, and understand why you are at times frustrated with the medium or tired of reading from the screen, you are more likely to cope with those feelings and perhaps also able to modify your web reading strategies. Similarly, an awareness of your own attitudes and preferences, for instance, whether you think that it is easy to find information on the web, or that there is reliable information on-line to begin with affects your use of the medium. Also such questions as what colours or modes of meaning you prefer and how they influence your reading on-line help you to relate yourself to the web content you are reading or writing. For as has already been argued above, the novelty of the medium challenges its readers and writers into meaning making processes that require awareness of how we read and why we seem to trust some information sources more than others.

Secondly, task knowledge on web literacy refers to knowledge about various task types and task demands that the web as a medium exposes you to. This form of metacognitive knowledge is important in the sense that the medium is under constant development, and along with this development, new tasks emerge. Task knowledge of the web can be understood from the perspective of what you know that is possible to be done on-line. For instance, knowing that in addition to searching information you can also communicate on-line, broadens your perspective on web literacy. And only

after you have this knowledge you can start to learn how to communicate on the web. Another example of task knowledge has to do with reading on-line. Applying the strategies of reading print texts to reading web content may work to an extent. Yet, in order to be web literate, the reader needs to know that web content is interactive and that you need to move the cursor on the screen, for instance, to check if some of the images are hyperlinks to other pages. Task knowledge can also refer to more cognitive tasks on the web, for instance, the knowledge of the tasks such as reading images and assessing the credibility of web content. This kind of task knowledge is not very clearly present in the definitions (see Table 1). What needs to be said is that the skills and strategies need to be first understood as knowledge of the skills and strategies. After knowing about the tasks you need to manage the web, you can begin to put them into practice. Only after this the task knowledge results in actual skills of using the web.

The third component of metacognitive knowledge, strategic knowledge refers to knowledge of what strategies there are, and when and how to apply these strategies. In other words, task knowledge is not enough, for you need to have knowledge of the actual strategies with which you might be able to accomplish these tasks. An awareness of your goals when using the medium (see Table 1: Ministry of Education 2000) should result in selecting the suitable strategies for that purpose. When thinking about web literacy, the web poses its readers and writers more freedom, as the reading path is not linear. Various reading strategies, such as skimming and scanning naturally apply in this electronic environment, too. Another reading strategy could be the use of the cursor on a web page in search for links to other pages or the use of the Find function of the browser, with the help of which you can easily locate words and phrases on a specific web page. Other examples are knowledge of different searching strategies and different strategies for assessing web content, which are highly important on-line. It is a prerequisite for the actual use of the strategies and for successful use of the web to know the strategies there are, and to be aware of the purposes of reading and writing.

All of the three areas of metacognitive knowledge can also be viewed from the perspective of others (Tynjälä 1999:114-115). Similarly to a web reader and writer being aware of his/her own use of web, it is important to know how other web readers manage the medium. The individual differences when reading on-line need to be acknowledged. Also an understanding of how we read the web and why we read it in different ways needs addressing. Furthermore, the metacognitive side of web literacy can also be understood as the knowledge about the meaning making processes. For instance, in the lines of the New London Group's (2000) socio-constructive knowledge building (ch 2.2.1), understanding how we construct meanings and relating that to the medium in question is very relevant for any literacy development.

To sum up, we have already pointed out the diversity of the definitions of web literacy. In this chapter we introduced a viewpoint to web literacy which has not been that clearly addressed in earlier research. Our goal when defining web literacy has been to build a working definition that can be used for the pedagogical purpose of supporting the learner to develop towards web literacy as autonomous managing on the web. Because of this, we find it important to change the focus from the skills to both content knowledge and especially to metacognitive knowledge. For we argue that it is only through building your metacogniton that you can strive for independence when faced with a medium such as the web. Without an awareness of yourself as a web reader and writer, the nature of web literacy is less self-directive, and adapting to the changes in the medium and its content is more difficult.

2.4 CONCLUSION

We began this chapter by presenting the socio-constructive framework in which web literacy, as all literacies, is regarded as context bound, both historically and socially. Also in the present study we understand web literacy as a set of social practices situated in today's society. Web literacy related terms and definitions directed us to focus on a variety of aspects that are related to the web. To sum up this analysis, we define web literacy as

autonomous managing on the web. This refers to both reading and writing on the web. We approach the concept of web literacy through three interrelated fields: skills in using the web, content knowledge of the multimodal medium, and an awareness of oneself as a web user.

The definition and the model of the three interrelated fields of web literacy have several implications for both the creation of the content of the learning space, and for the social practices the learning space facilitates. As to the process of creating the learning space, the model makes it more accessible to focus on particular areas of web literacy at a time, and to formulate the tasks in relation to the specific content knowledge and/or metacognitive knowledge goals. It also ensures a more extensive coverage of the many-sided concept.

As to the learners and the social practices, the definition itself calls for social interaction and some form of collaborative knowledge construction. Within the socio-constructive framework the learners are seen to construct their own conceptions on what web literacy is and on how web literate they perceive themselves. The broadness of the definition ensures that there is both something new and something familiar in the content of the learning space. This results in various expertise among the possible learners of the learning space. This, then again, makes it possible for the learners to share their own knowledge and benefit both from the learning space and the learners in the learning space when constructing their own conceptions on web literacy. In addition, the topic of web literacy becomes more accessible for all, because it is seen to build on traditional forms of literacies.

When focusing on the actual learning, which will be further discussed in the following chapter, the definition has the strength of focusing on the essential. It would be a huge leap to assume that we can teach real skills and strategies in a comprehensible way within the restricted framework of the study. Focusing on the content knowledge and metacognitive knowledge, then again, seems more reasonable, and can in fact be seen to precede the

development of actual skills that are needed in autonomous managing on the web.

As we now have presented the framework of how web literacy is understood in the scope of this study, we will move on to introduce the pedagogical premises for learning web literacy.

3. SOME PEDAGOGICAL NOTIONS FOR LEARNING WEB LITERACY

3.1 INTRODUCTION

As the conceptual framework of web literacy has now been introduced it is time to turn towards the concept of learning. Salmon (2002a) uses a metaphor of a planet when she presents different scenarios to on-line learning. Each planet has its own premises on "assessment, research, teaching philosophies and learning technologies". Salmon's planets introduce different possibilities the educators can adopt, that is, various forms of social practices of on-line learning that are based on various theories and pedagogies. Netro can be regarded as a planet that builds on a number of theories on learning, certain pedagogical thinking and social practices. The goal of this chapter is to describe these pedagogical premises of Netro, in other words, to introduce the ground pedagogy on which the learning space Netro is built. In other words, we answer the question of how the learning space Netro supports the learner to cope with the medium, that is, how to learn web literacy on the web.

In this chapter we will first elaborate on the concept of autonomy as a goal of all learning in knowledge society (see eg. Little 1991, van Lier 1996, Benson and Voller 1997, Benson 2001, Bereiter 2002). Then we will side-track from the socio-constructive path and turn our focus on the individual learner and on the cognitive-constructive processes through which learner's metacognition can develop (see eg. Wenden 1998, Tynjälä 1999). We will then introduce the socio-constructive core concepts of meaning making as

collaborative knowledge construction (see eg. Scardamalia and Bereiter 1994, 1999, Tynjälä 1999) and discuss the learners' new roles in this process (Lave and Wenger 1991). As an example of practice to which Netro's pedagogical premises are parallel, we will briefly introduce one approach to teaching literacy, the Pedagogy of Multiliteracies (The New London Group 2000). And because our aim is not only on the concept of web literacy but also on learning web literacy on the web, the role of technology needs to be explored. Our focus is naturally on how the web can facilitate collaborative knowledge building processes (Scardamalia and Bereiter 1994, 1999, Beatty 2003), and on the changing roles of learners and teachers in web-based learning (see eg. Warschauer 1999, Taalas, Kuure and Saarenkunnas 2000).

We will conclude this chapter of learning related issues by clarifying how this theoretical framework of learning is present in Netro, the web based learning space we created to facilitate web literacy.

3.2 LEARNING WEB LITERACY AS AUTONOMY DEVELOPMENT

Our focus in this study, that is web literacy, is needed in all the spheres of life from studies, and working life to the more private spheres of life. In other words, managing this new medium can be seen as a transferable skill, a supporting skill that helps us to be active members of the communities we live in.

Similarly to the understanding of all literacies through the socio-constructive paradigm (see ch 2.2), we have adopted a socio-constructive approach to learning according to which meaning making and learning are social in nature and cannot be separated from the social, cultural or historic context (eg. Tynjälä 1999:44). Nevertheless, in this chapter we will present learning as autonomy development and introduce the sets of cognitive processes through which learners can develop towards web literacy. Our focus is first on individuals and on intrapersonal side of learning before moving on to elaborate the social nature of all learning.

3.2.1 All learning as autonomy development

Let us begin the description of the pedagogical principles of the learning space Netro by thinking about a simple report of learning to ride a bicycle resembling what we understand as the aim of all learning.

> *When learning to ride a bicycle after hours of practice the two extra wheels supporting the bike are lifted higher and finally removed completely. The child learns to use the vehicle independently, first under adult guidance but later on, biking trips with siblings and peers may well be preferred to parents' company and new tricks are learned from peers. And eventually, after getting to know the routes of the neighbourhood it is likely that new quarters of the city will be explored, too.*

The goal of learning in this case of riding a bicycle does not necessarily mean only the mastery of a number of specific skills, pedalling or braking, but a more holistic knowledge of being able to manage in various biking-related situations. And these situations reside in the lived-in-world. The optimal goal of learning thus is autonomy. Learning should support the development of autonomous individuals, who manage the in-the-world situations we are faced in our everyday lives. In the case of Netro, these situations are naturally the social practices that the web poses on us.

As was already discussed, the goal of learning on a larger scale can be regarded as managing the challenges of the knowledge society (Bereiter 2002). In this society change is a stable characteristic and there is an overload of information through various newer and older media. There are a number of characteristics education specialists use when describing learning that prepares us for this knowledge society. To mention a few, education should foster critical thinking, learning transferable skills, technological literacy, communication and negotiation skills, learning to learn, lifelong learning, self-directiveness and many more (see eg. Kohonen 1992:14-39, Scardamalia and Bereiter 1999:275, Ministry of Education 1999, 2003). All of the characteristics above share the idea of autonomy, the learner gaining more and more independence and becoming more and more capable of having control over his/her own learning.

Within the language learning research autonomy has been defined in various ways. According to Little (1991:7) autonomy can be defined as "a capacity for detachment, critical reflection, decision-making, and independent action. The various freedoms that autonomy implies are always conditional and constrained, never absolute." Benson (2001:47-50) defines autonomy as "a capacity to take charge of, or responsibility for, one's own learning." Van Lier (1996:12-20) discusses "the impetus for learning" coming from the learner, "who must want to learn" and argues for choice and responsibility being the central aspects of autonomy. According to van Lier, autonomous learners "have the freedom of choice, exploration, personal preferences but also responsibility for your own and your companions' journey".

If the goal of education is a person characterised as having the qualities above, the question is, how we can facilitate the development of such active lifelong learners. Education, thus, should foster learning. When striving for autonomy we need to support the learners so that they can develop their content knowledge but also their learning skills (see eg. Nunan 1992, Wenden 1998, Tynjälä 1999), that is to familiarise them with the cognitive-constructive and social processes through which we construct new knowledge, learn about ourselves and the strategies used when learning. For if we accept the more holistic view of learning as striving towards autonomy and as educators facilitate this attempt, it can be argued that learners become not only better learners but also more active members of the communities to which they belong (see eg. van Lier 1996, Benson and Voller 1997, Benson 2001).

The learning space Netro can be seen to facilitate autonomy development in several ways. To mention a few, our aim is to create a learning space that requires a self-reflective and critical approach. Similarly to the biking metaphor in the beginning of this chapter, Netro also gradually challenges the learners to become more independent and self-directed, to learn more and more about the web, as well as themselves as readers and writers on the web. Naturally, many of the skills Netro can be seen to develop are

transferable to other spheres of life and are not only bound to the context of the web.

Regarding autonomous management of the web as the optimal goal of web literacy development, and autonomy development as the goal of all learning, leads us to the question of how autonomy develops. According to Vygotsky (1978:57), any cultural development appears first on the social level and only after that on the individual level. In other words, autonomy is being fostered by social interaction. By adopting this view we want to integrate both the social practices as well as the individual minds into our pedagogical thinking. We begin with the latter, that is, how we as individual minds are understood to develop towards autonomy. Thus, in the following chapter we will briefly introduce a model of cognitive-constructive processes of learning.

3.2.2 A look into the mind of the individual

Whether we choose a constructivist approach which focuses on the individual or a more social form of constructivism, all constructivist approaches to knowledge and learning share the basic core of constructive thinking. According to these approaches, knowledge itself is regarded as relative. It is constructed by individuals and communities. Learners construct meanings and are seen as active cognitive actors, who interpret the world on the basis of their earlier knowledge and experiences (Tynjälä 1999:37-39).

We have stated earlier that our aim is to build our theory of practice on the basis of a socio-constructive approach to learning. However, before introducing the social aspects of learning we will have a look at the individual mind through an overview of a more cognitive-constructive approach. This is because in order to form a theoretical basis for learning web literacy it seems necessary to integrate the cognitive side of learning into our approach. For, as we defined web literacy as partly consisting of the knowledge and awareness of oneself as a web user (see ch 2.3.3), there is a

need to define this knowledge in more detail, as well as describe the cognitive processes through which learners gain this knowledge.

In the following, we will focus on the cognitive processes through which learners gain both content knowledge but also what we feel is more important in the light of the above: knowledge about knowledge and learning. We will begin by presenting a cognitive model of learning process and move on to describe the relationship between such cognitive key terms as awareness, reflection and metacognitive knowledge. Once more, we ask the readers of the following description of intrapersonal learning to kindly keep in mind the environment where meanings are constructed when engaging in social practices.

A cognitive-constructive approach to learning has its focus on the internal management of learning. Learners are seen as having mental constructs, based on their prior knowledge, experiences and beliefs through which they interpret the world. Terms tracing all the way back to Jean Piaget's work, such as assimilation and accommodation, are used when describing learning from the point of view of cognitive construction. Both relate to the idea of shaping mental constructs. When we encounter new things, we may either integrate them into the existing mental constructs (assimilation) that we have so far, or then again there might be a need to reconstruct and shape the existing construct in such a way that the new information fits into the scheme (accommodation) (Tynjälä 1999:39-41).

Following the cognitive-constructive premises introduced above there are several models of learning, which attempt to describe the cognitive processes involved in meaning making. For example, when presenting the principles of his language curriculum, van Lier (1996:11) describes such process as follows:

> "To learn something new one must first notice it. This noticing is an awareness of its existence, obtained and enhanced by paying attention to it. Paying attention is focusing one's consciousness, or pointing one's perceptual powers in the right direction, and making mental "energy" available for processing. Processing involves linking something that is

> perceived in the outside world to structures (patterns of connections) that exist in the mind."

Van Lier's cycle of learning begins from noticing and moves through paying attention to processing. In the present study we adopt a model similar to van Lier's, yet we use different terms. These are the terms in Benson's (2001:86-98) model of the three sets of cognitive processes, which are used when elaborating on the development of autonomy in language learning. These cognitive processes are building metacognitive knowledge, directing attention, and reflection. The cyclic process through which autonomy develops is illustrated in the picture below as we now move on to look at all the three sets of processes in more detail (see Figure 7).

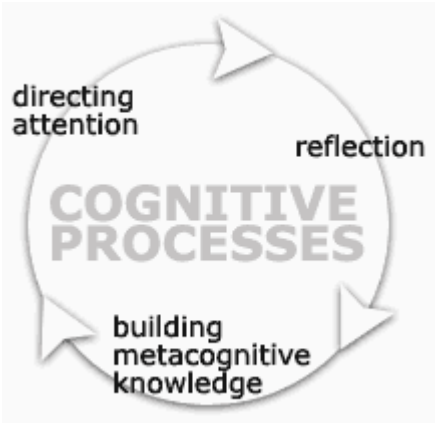

Figure 7. Cognitive processes (adapted from Benson 2001:86)

Metacognition is an awareness of one's own (and others') cognitive processes, thinking, learning and knowing. Metacognition is needed when a conceptual change takes place. Before you can change your conception, the mental construct that you have of that world phenomenon, it is a prerequisite to know what it is that you know (Tynjälä 1999:114-115).

Metacognition can be divided into two subcomponets: metacognitive knowledge and metacognitive skills. Metacognitive knowledge is regarded as stable, early developing system of related ideas the learner has about learning. In other words, metacognitive knowledge is what the learner knows about learning, whereas metacognitive skills refer to the learner's abilities to put the metacognitive knowledge s/he has into practice. In the

scope of this study we will focus on the metacognitive knowledge as it is a prerequisite for the metacognitive skills to develop.

Metacognitive knowledge can be divided into three areas: those of person, task and strategy related knowledge (see eg. Tynjälä 1999:114-115, Wenden 1998 in Benson 2001:95-98, Wenden 2001:45-46), which are illustrated in Figure 8.

Person knowledge is knowledge learners have acquired about how cognitive and affective factors may influence their own (or other's) learning, and how these factors apply in their experience, as well as how proficient the learners see themselves on a given area.

Task knowledge refers to the purpose of the task, knowledge about task types and task demands.

Strategic knowledge refers to knowledge of what strategies are, and when and how to apply these strategies.

Figure 8. Metacognitive knowledge

All the three areas of metacognition also play an important role in web literacy. The importance is in understanding that, for instance, there are no strict authoritative link lists and references that can be passed on the learners to manage the medium. What can be achieved is an awareness of the characteristics of the web and of yourself as a user of the web. For a more detailed description on how metacognitive knowledge relates to web literacy see chapter 2.3.3 in which we describe metacognitive knowledge as the third field of web literacy, in addition to the actual web literacy related skills and content knowledge of the web as a medium.

According to Wenden (1998 in Benson 2001:95-98), proficient learners are able to construct mental representations of how demanding the task is. This kind of use of one's metacognitive knowledge is understood to be as important a goal for learning as is the actual domain knowledge, whether it was a foreign language, chemistry, the history of Finland, or in our case, the web. Also Tynjälä (1999:115) stresses the need of control over metacognitive knowledge. She states that by managing your metacognition you are more self-directed. Similarly, the lack of metacognitive knowledge results in external management and dependence on external teacher or other instruction. This notion also supports the need for developing metacognition when the goal of learning is autonomy, as our goal is to help students to become more autonomous mangers of the dynamic and changing medium, the web.

Let us now move on to the two other sets of cognitive processes, directing attention and reflection. As presented in the picture (Figure 7, cognitive processes), metacognition is built through these two processes (Benson 2001). As has already been mentioned, before any learning will take place, you must first notice the object of your learning. In other words, awareness is a prerequisite to all learning (see eg. van Lier 1996). If you wish to change your conceptions, you must first become aware of your existing conceptions and express them explicitly (Tynjälä 1999:72-97). When applying this to learning web literacy, the learners need to first become aware of how they understand web literacy, before there can be any development. And as to directing attention, the learners' attention needs to be directed to the various aspects of web literacy if we wish them to broaden their perspective. For if web readers are not aware of, for instance, the importance of the visual mode on the web, and the effects it may have on reading, they are more likely to let the visual aspects of the web content effect the interpretation.

Bialystok (1994 in Benson 2001:89) defines awareness as "the result of the interaction between analysis and control." According to Bialystok, "analysed representations can be attended to by means of control of

processing in precise ways. More analysed representations are more articulated, and they allow attention to be brought to more detailed and more precise specifications of those representations…", which results in a "… subjective feeling of awareness." In other words, by noticing something and focusing on it we can begin to analyse what it is that we notice and express it in an explicit way. The result of this analysis is a representation, a mental construct of what it is that we first noticed. The more we analyse, the more articulated this construct becomes, and the more specific details and characteristics we can begin to focus our attention on later. Applying this process to web literacy could mean, for instance, the web readers' attention being directed to their own reading strategies on the web. This can be done by triggering them to think about how they read on the web, and by asking them to articulate these ways of reading.

The previous example is only one supporting activity for raising awareness. Wenden (1998:531) introduces a list of four awareness raising activities, which help the learners to "sharpen" their mental representations of the perceived. When introducing the awareness raising activities Wenden also touches on the third set of cognitive processes presented in the scope of this chapter, reflection. Reflection is another key psychological component of autonomy (Benson 2001:90-95). In Figure 7 reflection is located between directed attention and building metacognitive knowledge. Mere noticing is thus not enough, but the information needs to be processed, and the following awareness raising activities (Wenden 1998:531) can be understood as reflection eliciting activities. These are "elicitation of learner's metacognitive knowledge and beliefs, articulation of what has come to awareness, confrontation with alternative views, and reflection on the appropriateness of revising, expanding one's knowledge". Also free writing, mind mapping and social interaction for expressing one's conceptions in an explicit way have been suggested for awareness raising activities (Tynjälä 1999:85).

As we have now introduced the cognitive processes that help the learners to develop towards autonomy, there is still a need to focus on one of the

aspects that actually connects the cognitive to the social. That is the language needed in describing what it is that you perceive. This language is called metalanguage, also introduced by Cope and Kalantzis (2000:24). To give it a brief definition, metalanguage is language about language. Having a metalanguage on some specific topic has to do with being able to describe this topic and analyse it more fully. As a learning space, Netro aims at providing the learners with a metalanguage on web literacy, that is, on the meaning making processes and the characteristics of the web. As the attention is directed to a specific aspect of the medium, the learners still need vocabulary to conceptualise and put into words what it is that they notice. Metalanguage is needed in all the Wenden's (1998:531) awareness raising activities, for the activities require the learner to articulate their thoughts.

To summarise, the cognitive-constructive processes described above, that is building metacognitive knowledge, focused attention and reflection, illustrate the in-the-mind processes of learning as autonomy development. Elaborating on these processes is significant in the scope of this study for the development of metacogntion is closely connected to our definition of web literacy. In order to become web literate one must become aware of the medium and of one's relationship with that medium. Person knowledge of what kinds of web readers we are and what kinds of cognitive or attitudinal factors influence our reading are as important as the strategic knowledge of how to read for a particular purpose. Furthermore, task knowledge cannot be separated from the two, for knowledge of the novel tasks and new demands are highly important when dealing with such a new and diverse dynamic medium as the web.

In other words, to become web literate, users of the web need to gain this kind of metacognitive knowledge. Building metacognition requires directed attention to the characteristics of the web as well as to the learner, yet without a reflective approach on learning, and a metalanguage with which to articulate your thoughts, the metacognition will not develop. Luckily, the learner is not alone but a member of a knowledge building community,

which supports its members' learning processes, which takes us back to the social aspects of learning.

3.3 LEARNING WEB LITARCY AS MEANING MAKING

In the above, we have focused on the individual's learning through a cognitive-constructive approach to learning. It has been the mind of the individual that needs to be developed and the practices for developing it focus on the individual. However, within the socio-constructive approach it is a generally accepted premise that we are active members of the social systems in which we live, continuously building and rebuilding our representations of the world in connection with that surrounding world (Vygotsky 1978, Tynjälä 1999). This more social perspective on learning as meaning making takes us to an approach which can be said to prepare us for the life in the knowledge society.

Scardamalia and Bereiter (1994, 1999) ask a significant question of what kind of experience prepares us for the life in the knowledge society. By changing the focus from learning to experience Scardamalia and Bereiter shift the focus from the mind to the lived-in-world. This way it has become natural to them to examine the social practices that already exist in the world. Research teams strive to produce new knowledge and are seen as valuable source of insight to real life meaning making processes. As a result of such reasoning the answer to the question is that it is the experience in a knowledge building organisation that prepares us for the life in a knowledge society.

As we now move on to discuss some theoretical approaches on learning as meaning making we need to distinguish learning from knowledge building, the goal of which is to produce knowledge. In the context of language learning Krashen (see eg. 1981) separates learning from acquisition, on the basis of whether the learning is a conscious process that takes place in formal settings or whether language is acquired without conscious effort in authentic contexts. The distinction between learning and knowledge

building is somewhat different, for the focus is not on whether there is conscious cognitive processing taking place. Producing new knowledge does not need to be separated from learning. It can be understood as a prerequisite, a social goal, which is an active process of collaboration. In other words, while engaging in the social practices of the surrounding world the individual minds develop through the cognitive processes described in the previous chapter.

In the following, we will introduce an approach, collaborative knowledge building (Scardamalia and Bereiter 1994, 1999, Bereiter 2002), and discuss the aspects of collaboration and knowledge building community in more detail. We will also elaborate on the changing roles of learners and teachers as participants, from new-comers to old-timers, in social practices in the lived-in-world (Lave and Wenger 1991). Before actually focusing on the pedagogical principles of our learning space we will introduce the role of technology as a vehicle for meaning making, and also present the pedagogy of Multiliteracies (Cope and Kalantzis 2000) and how the framework it offers can be used when teaching web literacy, in other words, how it is applied in the learning space Netro.

3.3.1 Collaborative knowledge building communities

Collaborative knowledge building (Scardamalia and Bereiter 1994, 1999) is an approach to provide learners with authentic in-the-world experience of what their future in the knowledge society will entail. According to this approach, the aim of the knowledge building community is to produce new knowledge through sharing and collaborating. Members of the community bring into the community their own expertise and knowledge and share it by participating in the knowledge building discourse. The contributions are for the benefit of the community, yet, as individuals participate in this kind of dynamic and collaborative process, both collective and individual learning takes place.

Also Lave and Wenger (1991) in their approach to learning stress the importance of situated learning. According to them, learners' cognitions are connected to the situation, the context in which they are used in an inseparable way. Closely connected to the Vygotskian (1978) approach, also Lave and Wenger see the learners as not learning de-contextual knowledge but rather learning to adapt to the social practices of a community, in other words, learning how to act intelligently within that social environment. This kind of social environment can be facilitated by striving for authenticity of both knowledge building and the authenticity of learning goals, activities and materials (see eg. van Lier 1996).

Both Lave and Wenger (1991) as well as Scardamalia and Bereiter (1994, 1999) place an emphasis on collaboration. By collaboration they mean the members participating in the knowledge building discourse. Bereiter (2002:351-353) describes this discourse as a group thinking process. In other words, according to Bereiter (2002:58), thinking itself is a social process and knowledge resides distributed, outside the mind. This may seem contradictory to what we have already stated about individual minds and, for example, the development of metacognitive knowledge in chapter 3.2.2. We again refer to Vygotsky's (1978) idea that social practices precede individual learning. The individual learning, however, is always social and collaborative in nature. Even if you work "alone" with a book, a video, a web page, or another Available Design (see ch 2.2.1) it has always been constructed by someone, at some point of time in some social and historical context, and you can be seen to engage in a collaborative social practice.

Collaboration is also widely accepted form of learning within the language learning research. For instance, Nunan (1992) places an emphasis on learners as a significant resource for language learning. Also Kohonen (1992:14-39) discusses, to mention a few, the importance of joint responsibility, social support and the shared personal contributions as benefiting the group learning processes.

As to the learners, they are regarded as members of the community. We can also refer to them as participants who are actively involved in knowledge building. Lave and Wenger (1991) use the term legitimate peripheral participation, which contains the idea of the new-comer participants having an important, legitimate role in the community. Learners are regarded as participating in the community of practice and moving from peripheral participation to full participation in these cultural practices. The concept of participation contains both the intrapersonal and interpersonal activities and is used when referring to "situated negotiation and renegotiations of meaning" (1991:51).

In our case, Netro learning space is created to support the learning community in its collaborative knowledge building on the concept of web literacy. Situated learning refers to learning web literacy on-line, on the web, collaboration is facilitated by technology and the learners are regarded as important members of this knowledge building community. We will elaborate more on these aspects in relation to Netro later in chapter 3.4. but first we need to understand more about the role of technology in meaning making.

3.3.2 Technology as a vehicle for meaning making

When it comes to technology and how it can support the approach of learning as meaning making, we regard its key factor as facilitating collaboration. The development of technology as well as the approach to learning have shaped the role of technology in learning from behaviourist drilling tools to facilitators of communication and collaboration. (See eg. Kern and Warschauer 2000, Beatty 2003 for an introduction to the history of CALL). In the present study, we will focus on the latter, that is, the role of technology as a vehicle for meaning making, and discuss its role as a collaboration facilitator and describe the learning process in an on-line learning environment. By collaboration we refer to "the construction of shared meanings for conversations, concepts, and experiences" (Roschelle 1992 in Palinscar and Herrenkohl 2002).

An example of technology facilitating collaboration was introduced by Scardamalia and Bereiter already in 1983 (see eg. Scardamalia and Bereiter 1999:280-282, Scardamalia 2002) in a project called CSILE (Computer Supported Intentional Learning Environment), the second-generation version of it being referred to as Knowledge Forum. In this project technology is used as facilitating the knowledge building discussion of a community of learners. CSILE/Knowledge Forum is an electronic space for the members of a community to collaborate and produce new knowledge. In other words, it is both a space for collaboration, that is sharing individual thoughts and ideas, commenting on each other's thoughts and building open dialogues, as well as a database for storing and retrieving these comments and dialogues. Such pedagogical approaches to the use of technology in learning also facilitate the development of many of the knowledge society skills, for instance, collaboration and communication skills, as well as computer and web literacies being developed within such learning environments (Tynjälä 1999:161-162).

Why is it then that collaboration is enhanced by technology? Can we make some comparisons to face-to-face collaboration in classroom? Firstly, let us focus on the forms of communication that are supported by technology. As we have already argued, according to Vygotsky (1978), social practices precede intrapersonal individual learning. Along the lines of Vygotsky, collaboration between learners' results in what Vygotsky calls scaffolding (Beatty 2003:99). By scaffolding he means the learners helping each other to learn. In other words, "scaffolding describes a situation in which a learner interacts with someone who can guide, support and shape his or her learning" (Ellis 1998 in Beatty 2003:101). "Novices, largely unconsciously 'internalise' or accommodate to the goals, values and understandings of those more expert than themselves through scaffolded joint activities with those others and their associated tools and technologies" (Gee 2000:52). Thus, technology enhances such scaffolding, for it is possible to make all the contributions to the knowledge building discourse open to all the learners. Through web-based discussion forums and other publishing

functions learners' ideas and reflections are accessible for all in spite of time and place and the progress of discourse is visible. Beatty (2003:112) argues that the most significant benefit of such collaboration is "the way in which it serves to reveal information and ideas, not just to learners' collaborative partners but to learners themselves". Technology, thus, in a way changes the course of communication. The communication within a discussion forum is not necessarily directed to the teacher nor to some specific learner, but rather, for anyone in the knowledge building community who seems interested (Scardamalia and Bereiter 1999). This form of communication is often referred to as many-to-many communication (see. eg. Warschauer 1999, Saarenkunnas et al. 2000, Hampel and Baber 2003:173). The idea of scaffolding can be said to support the view that many of the lived-in-world problems cannot be solved by individuals but require the community in which the expertise is distributed (Tella 2000:23).

In addition to the form of communication, the aspects of pace and participation within a classroom discussion are also diminished, when learners can take their time to think and reflect on the topic before contributing to the process (see Tynjälä 1999:162 for asynchronous learning networks). Kohonen (1992:14-39) elaborates on collaboration as learners having the chance to bring in their personal contributions to learning situations. Through technology this process becomes more equal, as the learners as well as teachers are invited to become members of a community in which there are multiple levels of expertise. This form of equality naturally challenges the members of the community, for there are new requirements in an on-line communication situation. For instance, silence is a stronger message on-line than what it is in a classroom situation. Thus, learners in an electronic learning environment need to take more active roles as participators and generators of the discussion and take responsibility on the whole community's progress. (Taalas et al. 2000.) Furthermore, studies on computer-mediated-communication have shown on-line communication to enforce equal and democratic participation, since social clues such as gender, accent or status, are reduced (Warschauer 1999:61).

Another viewpoint on collaboration and scaffolding is on how the learning space itself can guide, support and shape learning. If we understand scaffolding as the learner facing gradually more challenging tasks and problems and the environment supporting the learning, the environment does not necessarily mean only the other members of the group. By careful structuring of the learning space, its content and instructions, the technology itself supports the learning process.

A recent example of how technology supports learning is Salmon's (2000:25-37, 2002b:10-36) five-stage framework which describes the process of web based learning and teaching. According to this model, there are five phases which learners go through in an on-line course. These phases are access and motivation, on-line socialisation, information exchange, knowledge construction and development (Figure 9).

Figure 9. Salmon's 5-stage model for on-line learning

According to Salmon's model (2000:25-37, 2002b:10-36), the learners need first to be provided with the access to the Internet as well as access to the learning space in question, whether it requires passwords, logins or some information on the use and the structure of the module. The functions of the learning space are introduced and practised. Motivating the learners in the beginning phase is considered highly important for the technical problems may still cause the learners to loose interest and find this new way of learning too difficult. On-line socialisation refers to the fact that in order to

create a learning community there must be communication. And in order to create an atmosphere in which learners communicate freely, support for getting to know the netiquette and forming a coherent group is needed. Only after this is established can the learners begin to exchange information related to the subject matter and slowly begin to collaboratively construct meanings. In Netro, we do not want to divide the learning process into such strict phases but believe that the phases overlap to an extent. However, Netro can be seen to contain all the Salmon's stages, even though they do not necessarily appear in such a clear linear order. How Salmon's stages are presented in Netro will be further presented in chapter 4.4.3 when introducing the learning space in more detail.

In addition to the technology supporting collaboration, we want to mention some additional strengths of electronic learning environments. First, technology provides multimodal possibilities for learning environments which can be seen to support individual learning preferences and learning styles (see eg. Svensson 2003:128-129, Hampel and Baber 2003:174). Secondly, technology also supports the cry for authenticity in learning (on language learning and authenticity see eg. van Lier 1996:123-146, Benson 2001:124-126). The web is a medium in which learners have the access to electronic resource materials never before at hand. This in turn can be seen as supporting learner autonomy. When faced with authentic texts, in this case web texts, the learners gain confidence in dealing with challenging authentic materials as well as learn to acquire new knowledge in authentic situations (Little 1997:230-235). In other words, in the case of web literacy this could be understood as the web readers being able to use the diversity of web content as an opportunity for learning more about web literacy. Thirdly, the hypertext structure of the web has also been claimed to support knowledge construction for the learners' are actively building their own reading paths by choosing which links to follow (Warschauer 1999:21, Luke C. 2000:72-73). The combination of interaction and reflection facilitated by technology is also considered to further facilitate critical thinking (see eg. Warschauer 1999:61). Finally, when the focus of the learning space is web literacy, the authenticity of the web based learning space needs no further

explanations, but it seems more than natural to integrate the target of the learning and the actual learning space Netro on-line.

3.3.3 An approach to teach web literacy: the Pedagogy of Multiliteracies

We have already focused on learning from the point of view of the socio-constructive paradigm, collaborative knowledge building and the role of technology as supporting these meaning making processes. What is still missing, before moving on to describe how the above is presented in our learning space, is a more coherent pedagogy of teaching literacy. In the present section we will introduce an approach, which is easily integrated into the pedagogic frame already introduced. This pedagogy is the pedagogy of Multiliteracies (The New London Group 2000), The Multiliteracies approach has already been presented in chapter 2.2.1 when we introduced it as one socio-constructive approach for understanding literacies. While the New London Group (2000:30-36) discuss the change in society resulting in new forms of literacies, they also introduce a form of practice (Cope and Kalantzis 2000:239-248) through which to teach literacy.

According to the Pedagogy of Multiliteracies (The New London Group 2000:30-36, Cope and Kalantzis 2000:239-248), there are four factors that need to be included into literacy pedagogy. These are Situated Practice, Overt Instruction, Critical Framing and Transformed Practice (see Figure 10). We will first shortly describe each of these factors and then connect them with the concepts and premises introduced in the previous sections of the chapter as well as to our concept of web literacy.

Figure 10. The Pedagogy of Multiliteracies

In a learning context, Situated Practice means using available Designs of meaning, including students own lifeworld experiences, and immersion in

meaningful practices in the given context. Next, the goal of Overt Instruction is conscious awareness and systematic understanding of what is being learned. It gives students a way to describe the patterns of Available Designs of meaning and the process of Designing meaning. The third step, Critical Framing, involves interpreting the social and cultural contexts of meaning. It involves students standing back from what they are studying and viewing the Design critically in its context, thinking about what the Design is for, what it does and whose interest it serves. Finally, Transformed Practice means applying the Design in a different context, or making a new Design. For example, students transfer a meaning to another context and make it work, or add something of themselves and make a reproduction.

Cope and Kalantzis's (2000) ideas on Situated practice are closely related to notions on authenticity of learning. Learning being meaningful, and the tasks coming from the students' lifeworld can be seen as similar to Lave and Wenger's (1991) notions on situated learning. Both learning tasks and materials are authentic and by participating in social practices learning becomes meaningful and motivating for the learners themselves. When the focus is on web literacy situated practice can be understood as placing the learners on the web and providing them the possibility for collaboration on the web, too.

Overt instruction, then again, can be connected with 'learning to learn' goals of learning and with building metacognitive knowledge (Tynjälä 1999, Wenden 1998, 2001). The learners' attention is directed to the aspects of the web or to their own conceptions of the web. Through shared reflections they can learn about themselves as users of the web. This way they become more aware of the aspects of the medium and of themselves as users of the medium. The scaffolding processes introduced in chapter 3.3.2 are also related to the overt instruction in the sense that the learners are supported by both the learning space and the other learners collaborating in the learning space.

Critical framing can be interpreted in the light of the socio-constructive paradigm, for the Multiliteracies view on texts (Designs) is very much a socio-constructive one. Texts are understood as relative, social and contextual. By presenting the diversity of the text world on the web and by attempts to categorise that diversity learners at the same time need to ask themselves questions such as what is the social and historical frame of this text: in which context is the text constructed.

Transformed practice can be understood as a product of Scardamalia and Bereiter's (1994, 1999) collaborative knowledge building process. As such, the goal of the learning space is that the concept of web literacy becomes more articulate, yet we do not ask the individual learners to produce representations of their own conceptions of web literacy. The idea is on building new knowledge, so we ask the learners in small groups at the end of module to contribute to the knowledge building process by producing a text that adds to the understanding of web literacy presented in the leaning space. The Redesigned is something the learners notice during the process that was missing from the description of the concept of web literacy. They can use the Available Designs at hand and produce their own Design which builds on the knowledge that has been produced in the learning space.

While it is important to realise that as such the Pedagogy of Multiliteracies is only one approach for teaching literacy it is still significant to notice its strengths as framing the learning process into phases that are easily adapted to all forms of texts and various practices in and outside classroom. Whereas Salmon's stages (see Figure 9 in ch 3.3.2) offer a strict step-by-step framework for on-line learning, Cope and Kalantzis's work seems more adaptable and flexible. Thus, as Salmon's stages are present in Netro to an extent, it is more beneficial to view Netro as following the lines of Cope and Kalantzis's (2000) Pedagogy of Multiliteracies, for many of the theoretical concepts and ideas are derived from their work. However, the theory of practice of our learning space should not be viewed as only representing this one approach for learning literacies. As we now move on to describe the learning space, the planet of Netro, in relation to all the aspects of learning

discussed in the course of the present study, we hope to give the readers a fuller account of the firm premises of learning Netro is built on.

3.4. THE PEDAGOGICAL PRINCIPLES OF THE LEARNING SPACE NETRO

Netro can be regarded as a learning space, yet, we also refer to it as a vehicle, for the name and the metaphor comes from travelling on a path from one place to another. The choice of the learning space to be situated on the web is natural because the topic is web literacy. Netro is a multimodal learning space, in which many of the web literacy related issues are presented. The technology, however, contributes more to the learning space than just an easy access to the subject matter. Having introduced the theoretical premises for learning as meaning making, the form of social practice that we want to support is accessible through technology. A web-based Netro has the strength of making ideas and thoughts public, which is a prerequisite for any collaboration to take place. Thus, as a vehicle Netro is a public one.

The goals of Netro as a learning space focus on the aspects of web literacy as we define it in chapter 2. In the light of the theoretical framework introduced in chapter 3.3.1, Netro can be seen as facilitating a collaborative knowledge building community. The Netro passengers form a community in which they function and contribute to the organisational goal of creating new knowledge on web literacy. Through the discussion forums and other publishing tasks the passengers contribute to the effort and bring into public what they perceive as important aspects of web literacy. Their reflections and discussions are open and in the ideal process they will build on each other. Through this collaborative knowledge building the concept of web literacy will develop, yet, simultaneously, individual learning will take place.

By individual learning we refer to the cognitive side of learning. Netro learning space is built not only to support collaboration but also to support the cognitive processes introduced in chapter 3.2.2. Netro attempts to direct

the passengers' attention, to make them notice aspects of the medium and guides them to reflect what it is that they notice. Netro builds on awareness raising activities (Wenden 1998:531). These are "elicitation of learner's metacognitive knowledge and beliefs, articulation of what has come to awareness, confrontation with alternative views, and reflection on the appropriateness of revising, expanding one's knowledge". The aim of these activities is that the passengers become more aware of the characteristics of the medium as well as of themselves as users of the medium. As the tasks and their reflections are all open and accessible for all passengers, this cognitive side of Netro can be seen as embedded in the social practices of the learning space.

We refer to the Netro learners as passengers to place an emphasis on the fact that in Netro meaningful social practice results in learning, and that we regard them as participants or members of a knowledge building community. These passengers are seen as contributing to the shared goal of building knowledge on web literacy as individuals with own fields of expertise, own autobiographical backgrounds and experiences. They are all new-comers in the beginning, but Netro supports the process of socialisation. Thus, Netro facilitates both collaborative knowledge building as well as individual learning.

The community, the Netro group, consists of passengers and of Tuomas (Figure 11), a virtual guide who guides the passengers in the learning space by asking them questions and commenting on the phase of the process. Tuomas's role is not only in giving instructions, but he is important in creating a more personal atmosphere on the learning space. Tuomas's use of language aims at making reflections less formal and academic, which will hopefully result in more open and active participation. Tuomas also illustrates the pedagogical approach of collaborative learning, for Tuomas himself is not an expert and can be seen to learn about the concept of web literacy alongside with the passengers. It is up to the teacher whether s/he wants to take part in the discussion by enhancing the knowledge building process or by merely focusing on the practical issues of moderating the

course of the process. A teacher, however, does not instruct the passengers for that is Tuomas's role. Thus, the teacher or possible teachers are also members of the community, passengers, who might be regarded as full-timers once they have travelled through the learning space few times and their own conceptions on the social practices and the product of the concept of web literacy have developed.

Figure 11. Tuomas

3.5. CONCLUSION

As we argued in the beginning of this chapter, the optimal goal of learning is autonomy. The optimal goal when thinking about web literacy in the light of autonomy would probably be something like becoming autonomous, creative and critical user of the web. This, then again, has to do with all the three areas of web literacy presented in chapter 2.3: the actual concrete skills, content knowledge of the characteristics of the medium as well as metacognitive knowledge of oneself as a user of that medium.

Netro, however, is not built to support the whole process, but it is rather a beginning of a journey. We focus on raising awareness on aspects of web literacy and building metacognitive knowledge so that the passengers can become more autonomous in their learning of web literacy. It would be irresponsible to claim that travelling through the learning space Netro you will become web literate. What we aim at is an awareness of what web literacy might be.

To conclude the theoretical framework for the learning space Netro, it is useful to once more repeat the goals of this all. Netro gives its passengers an experience of working on-line, collaborating with others, and working towards new knowledge, the concept of web literacy. This kind of social practice is easily related to Scardamalia and Bereiter 's (1994, 1999) notions of lived-in-world experiences supporting the learners in the knowledge society.

As to the concept of web literacy, the passengers of Netro are seen as becoming more and more aware of the medium and themselves as users of this medium, which is the first step towards autonomous managing of the web.

We will not discuss Netro in more detail in this section but will now move on to introduce the actual learning space. In the following chapters we will reflect on the theoretical premises of the learning space as we guide the readers through Netro and elaborate on the goals and procedure of the learning space in relation with presenting the module in a more detailed form.

4. NETRO - THE ELECTRONIC LEARNING SPACE

5. TEST DRIVE OF THE LEARNING SPACE

In this chapter we will give a report on the test drive of Netro. First, we will introduce the context for the course and give a more detailed account on the course. Then, we will give a report on the two forms used during the Netro course. The Netro passengers were asked to fill in both before and after the course a form in which we asked about their conceptions of web literacy. The answers are discussed in detail in the latter part of this chapter.

5.1 THE COURSE NETRO IN MAY 2003

Because Netro is a novel web-based module, which is not based on any other particular web-based learning platform or environment, we wanted to test the module in practice. As has already been discussed, the goal of Netro is in collaborative knowledge building and raising awareness on the topic web literacy. Thus, when testing the module our interest was naturally both on the actual electronic learning environment as a functional unit, as well as on the passengers' awareness of the concept of web literacy. We wanted to find out how the passengers would understand the concept of web literacy before Netro, and whether there were any changes in their perceptions after travelling through the Netro Path.

The context for testing Netro

Testing Netro took place at the Jyväskylä University Language Centre in 2003. We had originally planned to test Netro as an integral part of a compulsory academic reading course in the English language. However, because of the project of building the learning space was prolonged we needed to separate the module from the course. As a result, Netro became an independent optional language course which took place during summer term 2003, to be more specific, in May 2003 under the course code and the name XYH017 Netro - verkkolukutaito.

The only prerequisite for the course was that you needed to have taken a basic academic level course in English, i.e. one of the XEN**1 Text

Workshop - Academic reading and terminology courses. This we chose to include to the requirements since we felt that in order to be able to complete the various reading tasks in Netro, the passengers should have the basic knowledge and skills in reading strategies as well as in English, for the web material and example pages used in Netro are in English.

Our original goal was to get 12 student passengers from various fields of studies to prevent the groups from becoming too big as well as to make sure that we tutors could easily follow the discussions taking place in Netro. From twelve students we could have formed the ideal four groups of three students. After the search process for volunteer students the test group became to consist of 13 passengers from various backgrounds and fields of studies. The group was formed with the help of an electronic advert on the Language Centre web pages and an e-mail to the university students' mailing lists. At first, the course was advertised in the summer courses section on the web pages of the Language Centre. We published an independent advertisement on the pages two weeks before the course was supposed to begin.

As a result of the web advertisement, four students registered for the course. Due to the small amount of those registered, we decided to post an additional announcement of the course to the posting lists of different student associations at the university. The announcement resulted in dozens of applications. The total number of participants being twelve, eight students were selected in addition to those four registered before. Students were selected in order of registration, yet students who were not able to attend the first face-to-face meeting were not accepted. In addition to those students who applied on the course more independently, there was a group of four students from a specific language learning technology programme who were asked to take part on the course. In regard to the major subjects of the students, the Netro group became quite heterogeneous. The group consisted of students studying Languages, Sociology, Political science, Education, Musicology, Marketing, Accounting, Entrepreneurship, Information systems science and Computer science.

The course structure

To illustrate the overall course structure there were two face-to-face meetings, in between which the passengers worked on-line on the Internet, in the electronic learning space (Figure 19). During the both face-to-face meetings passengers filled in forms with which we wished to gain insight into their conceptions of the concept of web literacy. In the following, we will give a more detailed report of the course.

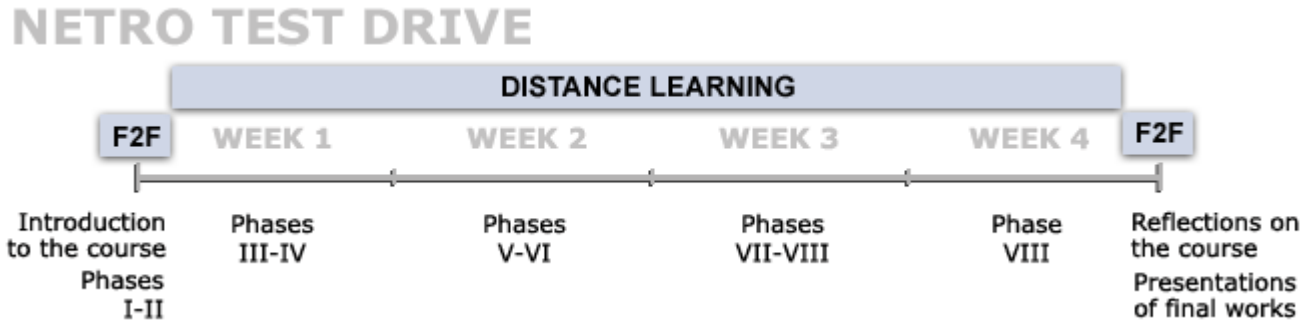

Figure 19. The structure of the test drive course in May 2003

The first F2F -meeting

As was already said, the course began on May 29th, with a face-to-face meeting at a university computer studio in Agora. The aim of the first meeting was to form the Netro passenger group, to get to know one and other as well as to give the passengers the support needed in beginning to study on-line in such an electronic space as Netro. In Salmon's (2000, 2002b) steps, this meeting is parallel with the first stage for on-line learning, that of access and motivation.

The first meeting included few "ice-breakers" and the passengers had a chance to see and get to know the other passengers with whom they would soon work only on-line. The course itself and the learning space were also introduced to the passengers.

In order to gain insight on the passengers conceptions of web literacy before actually looking at the learning space, the passengers were asked to fill in a form in which we asked about their conceptions of web literacy and the course at hand. This so-called pre-Netro form, which the passengers answered during the first meeting, consisted of open-ended questions on three different perspective on web literacy. We asked about the passengers' views of the aims and contents of a course carrying the name web literacy, the passengers' understanding of the concept web literacy, and their own relation and attitude towards web literacy, i.e. how web literate the passengers' see themselves (see Form A).

The form functioned as a tool for us tutor of the course, for we needed to learn about the passengers' preconceptions of web literacy in order to be able to see whether the learning space supports the kind of collaborative knowledge building we planned it to support. Then again, with the help of the form, we directed the passengers' attention to the subject matter of the course and hopefully helped them to orientate themselves towards the future tasks. Thus, it activated the passengers' prior knowledge and conceptions on web literacy as well as informed us tutors of their expectations concerning the course.

After filling in the forms, we finally introduced the passengers with the actual learning space with the help of a data projector. The passengers were given a description of the three-fold structure and the logic behind the module, the terminology used, and the technical requirements for using the module, as well as instructions for working and proceeding in the module. In addition, the core idea of the module, as well as the criteria for grading the course were explained to the passengers.

Only after this introduction were the passengers allowed to enter the learning space and start working in their own pace with the first two Phases of the Path. Because we could not be certain of the level of web literacy the passengers were on, we wanted to make sure that all the passengers could actually manage the use of the discussion forum, in which the logs and the

discussion topics were located. The two Phases give a detailed description of the structure and the pedagogical idea of Netro, allow the passengers to create a personal profile of themselves through which the members can get to know more of each other, as well as guides the passengers to practise the use of the discussion forums and the Logs. (For a detailed description of the Phases, see ch 4.4.3). We encouraged the passengers to carefully fill in the electronic form through which they created their personal profile, and emphasised the importance of the profile in future tasks, as well as advised them in registering to the Stop.

The final task of the face-to-face meeting was the forming of the Netro groups in which some of the tasks would take place. The passengers were given the freedom to form the three groups of three members by themselves. The groups were then given the passwords to the group specific forums, and advised to use the forum for planning the group tasks. At the very end of the meeting, we once more went through the schedule of the course, and agreed on the time of the final face-to-face meeting.

To give the readers of this work an honest account on the events and to make them prepare for the possible complications we want to mention that the first face-to-face meeting was shortened as we encountered some technical problems. The server where the discussion forum was located suddenly collapsed, luckily, every passenger managed to register to the forum, and create his/her Netro-profile before this happened.

Distance learning phase

From the first meeting onwards, the course went on for four weeks. During the distance phase the Netro passengers travelled through the Netro Path by working on-line and completing the tasks in the learning space. The passengers were guided to travel through two Phases a week. This schedule was necessary due to the collaborative nature of many of the tasks, such as discussion tasks and some of the reflective log tasks where the passengers were supposed to read each others' answers on certain tasks. With the

individual tasks, such as the log reflection tasks and the voting and writing tasks situated on the Path, the passengers were allowed to proceed in their own pace, even though the ideal pace was presented in the learning space.

Our role during the pilot was to act as tutors, advisors and readers of the work done. We encouraged the passengers to communicate and confront us via the cafe forum on the Stop, instead of using the e-mail, in order for all the passengers to be able to see the questions or comments. As tutors, we acted through the character of Tuomas, the virtual Netro guide. Tuomas advised the passengers in various questions and problems concerning the tasks and the functioning of the environment, and reminded them on the schedule and the ongoing tasks. In addition, we constantly followed the discussions, logs and the different tasks on the Path. Our choice was, however, not to interfere in the discussions, nor did we comment on writing on the logs, since we wanted to keep the work as independent and self-reflective as possible.

The second F2F -meeting

The pilot was finished on June 7th, in a seminar-like face-to-face meeting during which we went through the group tasks, the final works of the groups, as well as asked the passengers to fill in the post-Netro forms, with which we wanted to see what kinds of answers the passengers give to the web literacy related questions after taking the course.

As the passengers seemed to be in a hurry completing the tasks there was a need to continue the on-line discussion in the face-to-face meeting. This is the reason for beginning the meeting by spending a while on the group tasks and their outputs, i.e. the digital photograph task and the text production task. We gave each group the chance to present their working process and explain the outcome of the task, and the other groups then were able to comment and ask questions about the work of the group. Then, the groups presented their final course works. They were asked to state the reasons for selecting their topic and the mode of the output, describe their working

process and present the contents of their work. Again, the rest of the group had the chance to ask questions, and the contents and the value of the work for future Netro users were discussed.

At the end of the meeting, we gave the passengers the change to read their pre-Netro answers to which we had attached another form in which we asked whether their views on web literacy related questions had changed during the process. By giving the passengers the chance to have a look at the answers they had given in the first meeting we wanted them to recall the thoughts, opinions and even feelings they had before the course.

This second form, the so-called post-Netro form was designed on the basis of the first form, and included questions on four web literacy related perspectives: how the contents of the course related to the passengers' preconceptions, whether and how their understanding about the concept of web literacy had changed during the course, what they thought about the importance of web literacy, and whether and how their own relationship to web literacy had changed during the course. (See Form B.)

At the end of the meeting, the passengers were also asked to fill an electronic form in which we asked questions about the general functioning of the module, the passengers preferences on the different types of tasks, the amount of time spent on the module, the succeeding of the discussions, using the Bank and the functioning of group work. Although the focus of the course was on raising the passengers' awareness on the concept of web literacy, there was a natural need to get information of the module as a functional unit, as well as the organisation of the course itself for possible future development.

Next, we will focus on the pre- and post-Netro forms in more detail, and report the Netro passengers' comments on the various web literacy related issues.

5.2 NETRO PASSENGERS AND WEB LITERACY

We want to emphasise that the forms used in the test drive of Netro (Form A and Form B) should not be taken as devices for gathering research data that gives us valid and generalisable information about the Netro passengers' awareness. Instead, we used the forms as teachers of the course to familiarise ourselves with the passengers' preconceptions of web literacy, as well as to invite the passengers to reflect on the topic. In other words, the aim of the two forms was partly on the teachers gaining insight into the passengers' conceptions of web literacy both before and after the course, and partly on the passengers themselves expressing both their prior knowledge of the concept, as well as their conceptions of web literacy after the course reflected through their prior knowledge.

We will next introduce the forms and report the answers of the Netro passengers by dividing the content of the answers into three areas: (i) conceptions of web literacy, (ii) me as a web reader, and (iii) the need for web literacy.

We will begin with the conceptions of web literacy. The passengers were asked in the beginning of the course to define web literacy and list the areas and aspects they connect to the concept. At the end of the course, the concept was again addressed by asking the passengers if and how their conceptions of web literacy had changed, and how they understood the concept at that point.

In the pre-Netro forms (Form A), the most present area connected to web literacy was the skill of searching the web and finding relevant information. What was often attached to this was a critical and evaluative attitude towards the web. In addition, aspects such as etiquette, scanning, reading, communication, use of time, the visual mode on the web and web text types and genres were mentioned. However, in general, web literacy was perceived as a somewhat vague concept. For example, the question of the aim of the course and the definition of web literacy was answered in the

following ways (translated from Finnish): "general issues related to the web", "conceptualisation of the web", "to familiarise the passengers with the possibilities the web has to offer". It seemed difficult for the passengers to articulate what kind of aspects the concept of web literacy contains.

In the post-Netro form (From B), in turn, the conceptions of web literacy seemed more detailed, and all of the passengers wrote that their conceptions of the topic had broadened or at least changed to some extent during the course. In this form, areas that were related to web literacy were such as images, texts and styles and their interpretation and meaning, finding and evaluating information, reading and writing, as well as influencing and understanding the backgrounds of possible authors. What is interesting to notice when comparing these answers to the pre-Netro answers is that in addition to the reading related topics several passengers attached also writing and producing related topics, for instance, how to take into account the diversity of the audience when creating a web site.

As to the passengers' conceptions of themselves as web readers, the form in the beginning of the test drive revealed that most of the passengers regarded themselves as "average" or "quite proficient" web users. There were a few exceptions of "very proficient" or "not so proficient". After the course, many of the passengers saw themselves as more web literate than before the course, and they stated that their conceptions of web literacy had changed or broadened to some extent. However, what is most interesting to notice when examining the passengers' comments on their level of proficiency is the tendency that many of them regarded themselves not as web literate as they had perceived themselves before the course. It seems that as the passengers had gained more insight in the concept of web literacy, they began to feel the need to still improve in various aspects of web literacy. These new challenges might be interpreted as a call for web literacy education.

The passengers were further asked to state their views on the need for web literacy both in the beginning and after the course. In the pre-Netro form, a common view was that web literacy is needed in managing everyday life.

Web literacy seemed to be considered as an important part of functioning in the different areas of the society. After the course the passengers still agreed that web literacy is needed in all areas of life: in work, in studies and in leisure. Aspects such as finding relevant and reliable information, critical orientation to the web and getting to know different cultures through the web were mentioned as significant parts of web literacy. The overall impression is that web literacy was considered very important among the Netro passengers. One of the passengers wanted, in fact, "web literacy to be taught already in basic level education".

To sum up, through this brief overlook of the passengers' answers the two most significant insights are as follows. First, after Netro the passengers seemed to be more able to verbalise web literacy related issues than prior Netro. Secondly, there seemed to be a tendency of regarding oneself less web literate after Netro than before it. The forms give us valuable information on how web literacy can be understood, and what kinds of tendencies at least this particular group has. This kind of information is, of course, important for any teacher. However, it would be interesting to focus on the passengers' conceptions through a more strict research method through which we could gain more reliable data. For example, it might be interesting to learn more about whether the passengers really developed their metacognitive knowledge and content knowledge of web literacy during the Netro journey. However, this was not meaningful for the scope of this study.

6. DISCUSSION

The process from the idea of an electronic learning package on web literacy to the realisation of the learning space itself and the test drive of Netro can be viewed from various perspectives. Our roles throughout the process have been mostly that of learners. The process, nevertheless, can be assessed from the point of view of us learning as researchers, as educators, as tutors, as team workers, as web designers as well as in many other roles. In this

discussion section we will first focus on assessing the process from the viewpoint of us as researchers, and then move on to our other challenging roles as teachers in today's society.

Let us begin the discussion from the perspective of a researcher. As researchers our focus is, on the one hand, on the concept of web literacy and its definitions, and on the other hand, on the pedagogical approach chosen for this study. Furthermore, we want to state some areas in need for further study and spend some time assessing the learning space itself.

Earlier research on web literacy offered us a good starting point, but there was no one definition suitable for our purposes. Web literacy being a novel term to begin with, the literature and research dealing with the topic overwhelmed us with the various definitions and terminology used when describing the one and same phenomenon. Besides web literacy, terms such as Internet literacy, electronic literacy, hypermedia literacy, technological literacy and information literacy were used to describe literacies related to the web, not to mention the terminology of the many "subliteracies" of web literacy, such as visual literacy and hypertext literacy. Although examining the topic from slightly different perspectives, all the definitions and studies were related to what literacy means when the web is the medium, yet they usually referred to the Internet as a whole including also the other services besides the web. What was also somewhat confusing was that even the term web literacy was sometimes used to cover the whole of the Internet. Since web literacy in research was defined according to the specific goals and context of each research, we did not consider any of the definitions suitable as such, but saw the need to form a definition suitable for our goals and purposes.

The choices we made concerning previous literature in this study can be supported by the following arguments. Firstly, we focused on research and literature from various contexts and socio-historical situations. This is because we wanted to build a definition that has not only the perspective of the Finnish society. For even though Netro is built and tested in the context

of the University of Jyväskylä in Finland, it is important to broaden the perspective of web literacy, as the web is probably the most international medium so far. Secondly, the research and literature give depth to the concept for the different focuses they have. For awareness raising purposes we needed to cover as many areas attached to the term as possible, and tried to categorise the literature and definitions available in order to form a general field of various aspects related to web literacy.

If we now move on to our definition of web literacy (ch 2.3), the three categories in which we divided web literacy worked well for our purposes. Our definition places an emphasis on the content knowledge, that is, the knowledge of the medium, as well as on the metacognitive side of web literacy. In this way the definition does not necessarily reject any of the other definitions offered, yet, it focuses on the individual web readers' and writers' awareness of their actions. In other words, we believe that in all the definitions introduced in Table 1 many of the metacognitive aspects of web literacy are integrated in the concept, however, they are not articulated that explicitly.

The broadness of the definition can naturally be criticised, for it prevented us from elaborating in more detail on any aspects related to web literacy, and forced us to make choices of including some aspects of web literacy in Netro in the expense of others. For instance, the multimodal aspects of the web were examined merely from the point of view of the visual mode, and the linguistic mode did not receive the attention it might have deserved. The assumption behind this choice was that even though the linguistic mode is a very challenging field of study as such, the field of reading images is less familiar to the learners. Thus, the focus is on raising the learners' awareness on a less elaborated mode.

Another weakness that might be pointed out in our definition is the insufficiency of critical attitude towards the web. It is not completely neglected; yet, a more articulated and deeper elaboration on, for instance, cultural and ideological issues could still improve our understanding of the

concept. However, even though we do not focus on critical literacy that explicitly, it can be seen as underlying all of the definition. What we argue is that the shift from skills to content knowledge and metacognitive knowledge discussed in chapter 2.3 can be seen as facilitating a more critical attitude towards the web. For when you know a lot about the medium and are able to understand the meaning making processes through which you operate in that medium, you are more likely to evaluate the web content in more detail.

In addition to the literacy definitions, the pedagogical approach discussed in chapter 3 also requires further commenting. Salmon's (2002a) planets offer a clear starting point for pedagogical thinking. Through this simple metaphor of a planet, it is easier to narrow down the learning related theories and find the ones most applicable for the particular purposes. However, we do not want to simplify the pedagogical premises too much and it needs to be highlighted that from the point of view of research on learning there are still many questions that remain unanswered. In the scope of this study we mainly discuss the aspects of web literacy being taught on-line through the meaning making processes.

The pedagogy behind Netro is very challenging. Supporting awareness raising processes is difficult, so is measuring awareness. In the scope of this study we can only assume that something happened during the process. The forms used in the pilot, as has already been said, also give us a direction towards which Netro took this specific group of passengers. Another group of students, in another time and place, might have focused on very different aspects of web literacy. An interesting topic for further study, thus, would be a stricter measuring of individual changes in awareness in such knowledge building processes. In other words, what the “by-product” of participating in a knowledge building community is. Another aspect that needs consideration is the level of cognitive skills that a passenger has in the beginning of the course. We cannot assume that every passenger has the capacity for self-reflective thinking and has the level of self-directivity Netro requires. During one month, this development is naturally not that

considerable. Therefore, it must be acknowledged that Netro does not necessarily support the metacognitive knowledge building of every learner, but a certain level of self-reflectivity is required from the learners.

Also a challenge when thinking about awareness raising on web related issues is the diversity of the prior knowledge of the Netro group. However, this can be seen as a strength. For in collaborative knowledge building processes, the various expertise can be seen as supporting the shared knowledge building process and the learners scaffolding each others on different aspects of web literacy. As to the collaborative knowledge building processes, we argue that at least in the scope of the aims of our learning space, Scardamalia and Bereiter 's (1994,1999) approach seems to function. The aim of producing new knowledge on web literacy can be supported by the fact that the concept of web literacy, and what it demands from web readers and writers, is still rather vague, even among the researchers. Thus, it is quite natural to assume that the learners' conceptions of the web might be even less clear. Therefore, new knowledge is needed. In Netro there is at least a possibility of meaning making through both merely engaging in working on-line (see eg. Warschauer 1999) as well as through shared reflections with the Netro group.

Even though the main pedagogical idea behind Netro is grounded on various theories and pedagogical thinking, there are questions that need further attention. For instance, the aspects of collaboration on-line need further focus. Studies on how technology supports collaboration and the roles of learners and teachers in this process also need to be discussed in more detail. In addition, for instance, accessibility and usability of the learning space might also have deserved more focal attention in an action research such as the creation of Netro.

When thinking about the choices we made in the process of this action research some comments need to be made. It is very challenging to take the role of an educator in today's society and to attempt to grasp such an up-to-date topic as web literacy. What we learned in the process is that more time

in the grounding work might have improved the outcome. There seems to be a tendency of only at the very end of the process to see how it should have been done in the first place. Yet, the multi-dimensionality of Netro challenged us again and again and kept us engaged in the process. However, we admit that we took a clear risk when deciding to create Netro from scratch. A more practical procedure might have been to first build smaller tasks and test their usability, focus first on the smaller scale functions and only after this broaden the scope of the study. Luckily, and possibly resulting from the happy collaboration in which we often questioned and criticised each others thoughts and ideas, most of the problems were noticed before it was too late to overcome them. The result, thus, is actually much more than the sum of our individual work.

As teacher-researchers the process of creating such an electronic learning space as Netro changes the understanding of the profession. The span from planning to implementing and piloting the learning phase to finally reflecting on the results is an action research as such. Furthermore, it requires various competences varying from html language to communication skills in interdisciplinary teams and creative pedagogical thinking. To support the future endeavours of other colleagues, we will now comment on all the phases of this process in more detail.

The planning phase requires a creation of a strict framework to begin with. The needs of the target group of the learning space need to be assessed, so do the objectives of the space itself. To produce such learning space as Netro from scratch is time consuming and requires a lot of support, both technical and financial, notwithstanding the support needed in theory building and critical thinking. It is important to consider how adaptable the learning space is and whether the production is worth the time and money spent, that is, what kinds of additional value the learning space offers to the organisation, to its teachers, and students. In Netro's case, we saw a clear need to build an independent module to support the teaching of web literacy related topics, as well as to support and update the content of the existing language and communication courses at the language centre. Netro offers a

chance for collaborative knowledge building, sharing of ideas and thoughts related to web literacy. It remains to be seen how the Language Centre uses this additional tool. In the planning phase of Netro we already wanted to create a learning space which could be easily integrated into any language course. To mention a few possibilities of using Netro, many of the Phases can be used independently, and the Bank as such is an independent source of information. Furthermore, by merely changing the web material used in the activities from English to, for instance, Swedish or Spanish, the learning space also facilitates the development of language skills other than English.

The realisation of the plans is the next step in the process. A good concise metaphor is a useful tool and helps both in creation of the learning space as well as in its use. In addition, it gives shape to the learning space and enables the use of imagery and terminology to support your purposes. For instance, the creation of Tuomas brought life and character in the Netro vehicle, yet, he is not just a picture, but has a clear role and purpose in the learning space. Tuomas is a guide, not an authority and helps in creating a more personal and relaxed atmosphere in the learning space, which then again may result in a more open and relaxed discussion. Tuomas can be seen to scaffold the learning process. He also functioned as our alter ego as we communicated in the learning space only through Tuomas.

Technology naturally sets some boundaries, but we encourage teachers to use their imagination when planning electronic learning environments. As we both are skilled users of html editors and graphics software, we only needed support in the creation of the poll tasks and other more sophisticated applications. Naturally, it is often a question of technical skills, but if support is available, exceed your skills and challenge your thinking. For the multimodal possibilities of the medium should not be neglected. In the case of Netro, it was important to build a learning space in which the characteristics of the medium would be well presented. However, at least in our case, there came a need for compromising, as we disagreed with the technical support on how far, for instance, the technical realisations of the activities should be developed. We once more want to stress the importance

of a clear pedagogy behind the learning environment. The technology should naturally support this pedagogy, not the other way around.

The test drive phase of the process revealed how well the whole of the learning space functions as a unit, and gave us the opportunity to focus also on the individual tasks. We want to emphasise that the tutor's role in facilitating and administrating the course is not an easy one. A learner contract with the number and depth of learner contributions is needed to set the ground rules for communication on-line. Also, the importance of all contributions and active engagement needs to be stressed. In our test drive we made the conscious choice of not getting involved in the discussion, for we wanted to find out how well the learning space itself functions and supports the knowledge building processes. Naturally, the tutor's voice at more active presence in the learning space at times might improve the depth of reflection to an extent. By interfering in the process, we, however, would not have been able to see how much support is actually needed and what the weaknesses of the learning space are. We regard the teacher's role in collaborative knowledge construction significant, and emphasise the need for the teacher to engage in the discussion, not only as an administrator but also as a reflective expert on the subject matter itself.

Finally, there would be a lot that needs to be said about the learning space itself. We commented on the success of the various activities already in chapter 4.4.3 as we introduced the structure of the Path section of the learning space in detail. As the form of activities varies to an extent, it would also be interesting to find out more about the learner preferences and to see which on-line activities were seen as user-friendly and why. Of importance is also whether the navigation possibilities Netro offers and the metaphor of travelling helped the passengers during the course. We included an electronic form at the very end of the Netro Path, in which we asked about the functions of the learning space. To give a concise report on the data does not, however, fit in the scope of this study.

To sum up, when thinking about teaching in an electronic environment, Netro's success is in the attempt itself. As has already been said, the design and procedure of this study illustrates the diverse roles of a teacher in today's society. And the process can actually be viewed from the perspective of the pedagogical thinking on which the learning space itself is built. While creating Netro we have become more legitimate members (see Lave and Wenger 1991) of a collaborative knowledge building community (see Scardamalia and Bereiter 1994, 1999), as we have had the opportunity work in the context of University Language Centre and to participate in its development discourse. Through this membership, and within this context, we have had the opportunity for a meaning making process of our own. We started from the Available Designs, from existing concepts on web literacy and learning on-line, and on the basis of our own prior knowledge and constructions, Designed what can now be seen as the Redesigned, our understanding of how web literacy can be approached as both autonomy development and knowledge construction (see the New London Group 2000). As by-products of this process, we have gained new skills in the area of what Warschauer (1999:8) calls multimedia interpreting and authoring, in other words, reading and writing on the web. We have learned a lot about the medium itself and about meaning making processes on the web and elsewhere.

7. CONCLUSION

As the social practices in today's knowledge society set new demands for literacy educators, the web is one of the many media which needs focal attention. The web is integrated into the academia as university courses entail more and more on-line opportunities, notwithstanding the other spheres of life where the web has a prominent role. As a medium the web can be seen to change how we communicate, and how information and knowledge can be accessed, produced and distributed (Warschauer 1999, Luke C. 2000). To mention a few, the negative viewpoints towards the web are its uncontrollability, its lack of censorship, and "anarchic" nature (Luke

C. 2000:70). Luke also mentions the lack of management as a downside of the medium. Yet, even though we cannot manage the content of the medium, in this study we offer an approach to manage the medium itself and yourself as a user of that medium.

This study was a process of developing an electronic learning space Netro to facilitate the development of web literacy. We aimed at creating a learning space which takes the Netro passengers a step closer towards autonomous managing of the web. Through collaborative knowledge building processes the passengers not only produced shared new knowledge on web literacy related issues, but also had the opportunity to become more aware of the characteristics of the medium as well as themselves as users of this medium. This, then again, can be regarded as supporting autonomy development, and the cry for the development of what Castells (1996:371) calls the "interacting" members of tomorrow's society.

The design and procedure of the present study can be said to reflect the diverse roles and responsibilities of the teachers in today's knowledge society. We challenge the language teachers to be actively involved in the new multimodal forms of meaning making, and to boldly integrate web literacy into their teaching approaches. As the speed of technology development seems to increase, and the new forms of social practices (i.e. literacies) emerge, we language teachers have a significant role in ensuring the access for all. Through web literacy education we can support the development of a more equal, democratic society.

Naturally the research cycle does not end here, but Netro will be updated to meet the upcoming challenges. The Netro learning space, or at least the first version of it, can be found in the University of Jyväskylä Language Centre web pages http://kielikompassi.jyu.fi. We planned the learning space to be open and accessible for all interested, yet the first version of Netro is administrated by the Language Centre. Those interested can naturally also contact us, the creators of Netro, for more information. Similar projects to

Netro are more than welcome. Yet, we kindly ask you to not to plagiarise us but to boldly go where no one has gone before. :)

REFERENCES

Barton, D. and M. Hamilton 1998. *Local literacies: reading and writing in one community*. London: Routledge.

Beatty, K. 2003. *Teaching and Researching Computer-assisted Language Learning*. London: Longman.

Benson, P. 2001. *Teaching and Researching Autonomy in Language Learning*. London: Longman.

Benson, P. and P. Voller (eds.) 1997. *Autonomy & Independence in Language Learning*. London: Longman.

Bereiter, C. 2002. *Education and Mind in the Knowledge Age*. New Jersey: Lawrence Erlbaum Associates.

Bialystok, E. 1994. Analysis and control in the development of second language proficiency. *Studies in Second Language Acquisition* 16. 157-168.

Bolter, J.D. 1998. Hypertext and the Question of Visual Literacy In D. Reinking, M.C. McKenna, L.D Labbo and R.D. Kieffer (eds.) *Handbook of Literacy and Technology: Transformations in a Post-Typographic World*. New Jersey: Lawrence Erlbaum Associates. 3-13.

Breen M. P. (ed.) 2001. *Learner Contributions to Language Learning*. New Directions in Research. London: Longman.

Bronfenbrenner, U. 1979. *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harward University Press.

Burbules, N.C. 1998. Rhetorics of the Web: hyperreading and critical literacy. In I. Snyder (ed.) *Page to Screen. Taking literacy into the electronic era*. London: Routledge. 103-121.

Castells, M. 1996. *The rise of the network society*. Malden: Blackwell.

Cope, B. and M. Kalantzis (eds.) 2000. *Multiliteracies : literacy learning and the design of social futures*. London: Routledge.

Eagleton, M. B. 2002. Making Text Come to Life on the Computer: Toward an Understanding of Hypermedia Literacy. *Reading online* 6(1). Retrieved from http://www.readingonline.org/ 10.11.2003

Gee, J.P. 2000. New people in new worlds. Networks, the new capitalism and schools. In B. Cope and M. Kalantzis (eds.) *Multiliteracies: literacy learning and the design of social futures*. London: Routledge. 43-68.

Hammerlich, I. and C. Harrison 2002. *Developing online content: the principles of writing and editing for the Web*. New York: John Wiley & Sons.

Hampel R. and E. Baber 2003. Using Internet-based audio-graphic and video conferencing for language teaching and learning. In U. Felix (ed.) *Language Learning Online. Towards Best Practice*. Lisse: Swets & Zeitlinger. 171-191.

Harrison, C. 2003. Visual Social Semiotics: Understanding How Still Images Make Meaning. *Technical Communication* 50(1). 40-60. Retrieved from http://www.candocareersolution.com/publication/0553.pdf 27.11.2003

Janks, H. 2000. Domination, Access, Diversity and Design: A Synthesis for Critical Literacy Education. *Education Review* 52(2). Retrieved from http://search.epnet.com/login.asp 26.11.2003

Jewitt, C. and R. Oyama 2001. Visual Meaning: A social semiotic approach. In T. van Leeuwen and C. Jewitt (eds.) *Handbook of visual analysis*. London: Sage Publications. 134-156.

Kamil, M.L. and D.M. Lane 1998. Researching the Relation Between Technology and Literacy: An Agenda for the 21st Century. In D. Reinking, M.C. McKenna, L.D Labbo and R.D. Kieffer (eds.) *Handbook of Literacy and Technology: Transformations in a Post-Typographic World*. New Jersey: Lawrence Erlbaum Associates. 323-341.

Karlsson, A-M. 2002. Web literacies or just literacies on the web? Reflections from a study of personal homapages. *The Reading Matrix* 2(2). Retrieved from http://www.readingmatrix.com/articles/karlsson/ 29.11.2003

Kern, R. and M. Warschauer 2000. Theory and practice of network-based language teaching. In R. Kern, and M. Warschauer (eds*.) Network-based Language Teaching: Concepts and Practice*. Cambridge: Cambridge University Press. 1-19.

Kohonen, V. 1992. Experiental language learning: second language learningas cooperative learner education. In D. Nunan (ed.) *Collaborative Language Learning and Teaching*. Cambridge: CUP. 14-39.

Koski, J.T. 1998. *Infoähky ja muita kirjoituksia oppimisesta, organisaatioista ja tietoyhteiskunnasta*. Jyväskylä: Gummerus.

Krashen, S.D. 1981. *Second Language Acquisition and Second Language Learning*. Oxford: Pergamon Press.

Kress, G. 1995. *Making signs and making subjects: the English curriculum and social futures*. Personal lecture. Institute of Education, London University.

Kress, G. 1998. Visual and verbal modes of representation in electronically mediated communication: the potentials of new forms of text. In I. Snyder (ed.) *Page to Screen. Taking literacy into the electronic era*. London: Routledge. 53-79.

Kress G. 2000.Multimodality. In B. Cope and M. Kalantzis (eds.) *Multiliteracies : literacy learning and the design of social futures*. London: Routledge.182-202.

Kress, G. and T. van Leeuwen 1996. *Reading Images. The Grammar of Visual Design*. London: Routledge.

Lave, J. and E. Wenger 1991. *Situated Learning. Legitimate Peripheral Participation*. Cambridge: CUP.

Lemke, J.L. 1998. Metamedia Literacy: Transforming Meaning and Media. In D. Reinking, M.C. McKenna, L.D Labbo and R.D. Kieffer (eds.) *Handbook of Literacy and Technology: Transformations in a Post-Typographic World*. New Jersey: Lawrence Erlbaum Associates. 283-301.

Little, D. 1991. *Learner autonomy. Definitions, issues and problems*. Dublin: Authentic.

Little, D. 1997. Responding authentically to authentic texts: a problem for self-access language learning. In P. Benson and P. Voller (eds.) *Autonomy & Independence in Language Learning*. London: Longman. 225-236.

Luke, A. 2000. Critical literacy in Australia: A matter of context and standpoint. *Journal of Adolescent & Adult Literacy* 43(5). 448-461. Retrieved from http://search.epnet.com/login.asp 26.11.2003

Luke, C. 2000. Cyber-schooling and technological change: Multiliteracies for new times. In B. Cope and M. Kalantzis (eds.*) Multiliteracies: literacy learning and the design of social futures*. London: Routledge. 69-91.

Ministry of Education 1999. *Education, Training and Research in the Information Society. A National Strategy for 2000-2004*. Helsinki : Ministry of Education. Retrieved from http://www.minedu.fi/julkaisut/information/englishU/welcome.html 20.11.2003

Ministry of Education 2000. *Suomi (o)saa lukea. Tietoyhteiskunnan lukutaidot. Työryhmän linjaukset*. Helsinki : Ministry of Education. Retrieved from http://www.minedu.fi/julkaisut/pdf/lukutaidot.pdf 27.11.2003

Ministry of Education 2001. *Sisältötuotanto-työryhmän väliraportti 1. Opetusministeriön työryhmien muistioita. 6:2001*. Helsinki : Ministry of Education.

Ministry of Education 2003. *Ministry of Education Strategy 2015*. Helsinki: Ministry of Education. Retrieved from http://www.minedu.fi/julkaisut/hallinto/2003/opm35/opm35.pdf 20.11.2003

The New London Group 2000. A pedagogy of Multiliteracies designing social futures. In B. Cope and M. Kalantzis (eds.) *Multiliteracies: literacy learning and the design of social futures*. London: Routledge. 9-37.

Nunan D. (ed.) 1992. *Collaborative Language Learning and Teaching*. Cambridge: CUP.

Nunan D. and C. Lamb 1996. *The Self-directed Teacher. Managing the learning process*. Cambridge: CUP.

Palinscar, A. S. and L. R. Herrenkohl 2002. Designing Collaborative Learning Contexts. *Theory Into Practice* 4(1). 26-34.

Reinking D., M.C. McKenna, L.D Labbo and R.D. Kieffer (eds.) 1998. *Handbook of Literacy and Technology: Transformations in a Post-Typographic World*. New Jersey: Lawrence Erlbaum Associates.

Roschelle, J. 1992. Learning by Collaborating: Converging Conceptual Change. *The Journal of the Learning Sciences* 2. 235-276.

Saarenkunnas, M., S. Järvelä, P. Häkkinen, L. Kuure, P. Taalas and E. Kunelius 2000. NINTER - Networked interaction: theory-based cases in teaching and learning. *Learning Environments Research* 3. 35-50.

Salmon, G. 2000. *E-Moderating. The Key to Teaching and Learning Online*. London: Kogan Page.

Salmon, G. 2002a. *Future learning encounters*. Keynote presentation in Eurocall 2002, Jyväskylä, Finland. Retrieved from http://www.solki.jyu.fi/eurocall2002/eurocallencounters.pdf http://www.atimod.com/presentations/download/Eurocall.htm 20.11.2003

Salmon, G. 2002b. *E-tivities. The key to active online learning*. London: Kogan Page.

Scardamalia, M. 2002. CSILE/Knowledge Forum®. *In Education and technology: An Encyclopedia*. Santa Barbara: ABC-CLIO. Retrieved from http://ikit.org/fulltext/CSILE_KF.pdf 20.11.2003

Scardamalia, M. and C. Bereiter 1994. Computer support for knowledge-building communities. *The Journal of the Learning Sciences* 3(3). 265-283. Retrieved from http://carbon.cudenver.edu/~bwilson/building.html 20.11.2003

Scardamalia, M. and C. Bereiter 1999. Schools as knowledge-building organizations. In D. Keating and C. Hertzman (eds.) *Today's children, tomorrow's society: The developmental health and wealth of nations*. New York: Guilford. 274-289.

Snyder, I. (ed.) 1998. *Page to Screen. Taking literacy into the electronic era*. London: Routledge.

Snyder, I. 1998. Beyond the hype: reassessing hypertext. In I. Snyder (ed.) *Page to Screen. Taking literacy into the electronic era*. London: Routledge. 125-143.

Sorapure, M., P. Inglesby and G. Yatchisin 1998. Web literacy: Challenges and Opportunities for Research in a New Medium. *Computers and Composition* 15. 409-424.

Sutherland-Smith, W. 2002. Weaving the literacy Web: Changes in reading from page to screen. *The Reading Teacher* 55(7). 662-669. Retrieved from http://search.epnet.com/login.asp 26.11.2003

Svensson, P. 2003. Virtual worlds as arenas for language learning. In U. Felix (ed.) *Language Learning Online. Towards Best Practice*. Lisse: Swets & Zeitlinger. 123-146.

Taalas, P., L. Kuure and M. Saarenkunnas 2000. Interaction and teacher role in a web learning environment: How to support new learning cultures? In U. Nuldén and K. Pessi (eds.) *CSCL, Second Nordic Workshop on Computer Supported Collaborative Learning and Knowledge Empowerment*. Conference proceedings. 15.-17.4. Göteborg, Sweden.

Tella, S. 2000. Verkko-opetuksen lähtökohtia ja perusteita. In *TriO Project. Teaching, studying and learning materials in a network-based learning environment*. Ministry of Education. Media Education Centre. 9-25. Retrieved from http://www.edu.helsinki.fi/media/trio/loppuraportti/tella.pdf 27.11.2003

Thoman, E. 1999. Skills and Strategies for Media Education. *Educational Leadership* 56. 50-55. Retrieved from http://search.epnet.com/login.asp 26.11.2003

Tynjälä, P. 1999. *Oppiminen tiedon rakentamisena. Konstruktivistisen oppimiskäsityksen perusteita*. Helsinki: Kirjayhtymä.

van Leeuwen T. and C. Jewitt (eds.) 2001. *Handbook of visual analysis*. London: Sage Publications.

van Lier, L. 1996. *Interaction in the Language Curriculum. Awareness, autonomy & authenticity*. London: Longman.

Vygotsky, L. S. 1978. *Mind in Society*. Cambridge, MA: Harvard University Press.

Warschauer, M. 1999. *Electronic literacies. Language, Culture, and Power in Online Education*. New Jersey: Lawrence Erlbaum Associates.

Wenden, A. L. 1998. Metacognitive knowledge and language learning. *Applied Linguistics* 19(4). 515-537.

Wenden, A. L. 2001. Metacognitive knowledge in SLA: the neglected variable. In M. P. Breen (ed.*) Learner Contributions to Language Learning. New Directions in Research*. London: Longman. 44-64.

Werlich, E. 1983. *A Text Grammar of English*. Heidelberg: Quelle & Meyer.

APPENDICES

Form A
Form B

Netro - electronic learning space