Digital literacy – towards a re description of literacy for the digital learning environments

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Abstract:

The concepts of 'digital literacy' and 'digital competence' are the focus in this paper. The paper will argue that the traditional concepts regarding literacy need to be re described and augmented when faced with the challenges and affordances of the digital learning environments. The paper will suggest a theoretical framework for how to understand the ways in which young people include digital technologies into their social and cultural practices. Some examples from the empirical material will be shown. The traditional concepts of literacy will be juxtaposed to the development of the digital practices that are being developed in parallel by the learners themselves outside the control and influence of the classroom.

1 Introduction

In the recent educational discourse the concepts of 'digital literacy' and 'digital competence' have come to the centre of attention. In many European countries the educational authorities have met the challenges the digital technologies represent by introducing different measures to ensure that the educational system gives the necessary training in the new technology. Emphasis is made on providing access to computers and networks, and developing the necessary skills to employ the digital tools for the emerging 'knowledge society'. In Norway this development is manifested in a series of governmental initiatives the last few years. The most recent is the Knowledge Promotion (i.e. 'Kunnskapsløftet') in which digital competence through digital literacy is described as having implications for the GNP, industrial development, research and learning in schools[1]. Moreover, in accordance with Norwegian traditions, strong egalitarian and democratic concerns are expressed. Access for all and equal opportunities for all permeate these initiatives. In the Knowledge Initiative the idea of digital literacy is basically connected to a descriptive understanding of competence based on relatively clearly defined skills.

[1] See http://www.regjeringen.no/en/dep/kd/Selected-topics/andre/Knowledge-Promotion.html?id=1411 for details.

However, the argument of this paper is that this focus on skills is by far sufficient to account for how the digital technologies are taken into the social and cultural practices of young people. The paper will argue that the literacy developed in parallel in the youth culture is perhaps more relevant to a future in the knowledge society. The paper will first account for the traditional concepts of literacy. We will then argue that understanding literacy in a digital context is also dependent upon a different perspective on technology, a perspective based on an ecological understanding of the relationship between man and his surroundings. Having established this perspective as a lense through which to look, we will look at some project in schools and show what kind of literacy is developed. The nature of literacy will be identified in accordance to the level of artifacts being developed. The tertiary artifacts developed, building on primary and secondary artifacts, will indicate more in depth the level of appropriation that these learners are able to develop. Finally, we will suggest components to a re description of literacy for the digital learning environments.

2 Literacy – some traditional concepts

Literacy is traditionally defined as the mastery of reading, writing and numbers. As Tyner observes, literacy is closely connected to the technology of the epoch in which it is defined (Tyner 1998). Consequently, the notion of literacy cannot be perceived as static or given. Tyner also emphasizes the strong social implications of literacy. In any culture literacy has strong social and economic implications, and the mastery of and access to the means of literacy functions as a gate keeper to that culture. Literacy becomes an enabling factor. According to Tyner, literacy traditionally has a retrospective and conservative nature. Freire introduces the idea that traditional literacy is confined to a mainstream culture and that it may represent a potential trap if one does not belong to that culture (Freire and Macedo 1987). To Freire literacy is seen as the ability, the possibility and will to read the world. To read a world that in constant change and expansion raises new demands in order to fully participate. Since literacy is so closely connected to technology, literacy will reflect a given perspective upon literacy. Consequently a perspective on technology is necessary to include when re describing components and characteristics of literacy for digital learning environments.

3 Perspectives on technology – from tools to emerging practices

In recent literature the role of technology in the development of knowledge is rarely a topic. However, given the increasing role technology has in most people's lives today, it is necessary to describe the role technology may have in learning and knowledge development. We may traditionally distinguish between two perspectives on technology, which in their extreme positions are either utopian or dystopian. The utopian views have in common that technologies such as the web may be seen as arenas for social and cultural development, a haven for personal and social development (Negroponte 1999). The dystopian perspectives focus upon the submission of culture to technology (Postmann 1992). This distinction has furthermore characterized the popular understanding of the new digital technologies.
There is, however, a third perspective possible and we will in the following trace and review some of the research that suggests some of the constituents of a third perspective on technology. A number of recent surveys and research reports have studied the practices developing partially outside the schools and classrooms (Tapscott 1999, Drotner 2001, Livingstone & Bovil 2001). These studies describe how young people approach the new technologies in different ways than as mere tools. Young people are now increasingly living in a converging media culture. They are not restricted to one technology alone, but move between several technologies; cell phones, game consoles and the applications of the web.

Areas of usage and purpose of usage blur and influence each other. In such technology rich contexts new skills, new qualifications and competences are developed, and these have not been subject to the interest of the educational system. These perspectives are further enriched by the work of Nardi and O'Day (Nardi and O'Day 1999). Their focus is upon the activities that take place, the contexts where social and cultural expressions take place within a technological framework. To Nardi and O'Day technology is that which is co developed in the interplay between man and his technological surroundings. Nardi and O'Day employ terms originating in ecology and activity theory, notably *affordances* and *appropriation*. Affordances are the characteristics and possibilities that a given technology may yield, intended or not (Gibson 1979, van Lier 2000). Appropriation denotes the actual adoption that takes place (Bahktin 1981). Perceiving technology in such a perspective is more pragmatic and constructive and avoids the utopian – dystopian dichotomy. Technology may in such a perspective be seen as a constituent of the lifeworld, and not a threat. The philosopher Andrew Feenberg supplies this perspective when stating that technology basically is social, and that the social dimensions are integrated components of the essence of technology (Feenberg 1999). With a reference to the *Bildung* tradition, the co development between man and technology represents the individual in '*freiesten Wechselwirkung*, in an unrestrained interplay, with its surroundings (von Humboldt 1793). Such practices may be described as *emergent*, denoting that they occur as interplay between people, activities, technologies and intentions in constant movement, and are realized differently as the context changes (Kelly 1994, Johnson 2001).

4 Examples from the field

Building upon this theoretical approach we will now move to some classroom settings that more clearly illustrates the kind of skills that are being developed.

4.1 Example 1: The web as a source for information for building content

A typical project in many schools is where the learners define their own topics. We will here use material from a previous research project to exemplify the literacy skills that may be developed.[2] The two topics we refer o here were titled "The Kennedy Family" and "Elvis". Right away in these two project groups the learners came to realize the material they found on the different web sites were of quite different quality. Some of them were pure factual information in the encyclopedic sense, some were biased or titled towards very specific or narrow parts of the topic (such as the alleged girlfriends of the Kennedy brothers), some were obviously bogus, some sites openly collected myths and legends. Other categories were emotional sites (i.e. personal statements regarding Elvis/the Kennedys) , and fan-oriented (focus on trivia, pictures, selection of information from the yellow press).

The learners also develop a strategy of using many applications at the same time. Typically they use more than one search engine, or instances of the same web site. To gather information they either collect the sites in collections of bookmarks, or establish a word document to copy material they are going to use later. Multitasking, the seamless switching between applications, becomes a characteristic of their way of working. In sum, all this *expands* what the learners need to master. Central in their learning will be to develop a

[2] The empirical material referred to here originates in an empirical material gathered in the doctoral project, "Emerging learning practices –Reflections on Didaktik in Web Rich Learning Environments" (Hokstad 2007). The material was collected from a class in upper secondary school

concepts for how to select and how to reduce amount, time and to narrow in on the content construction.

In sum, the learners became aware of the need to assess their material, the way they work, in new ways that their training had not prepared them for. In these projects the learners shifted from establishing truth to establishing trust with regards to their material; how can we build a content that we can relate to with some confidence?. In the process they develop a set of selection strategies. These selection strategies have to on the one hand relate to the abundance of the material found, and to the complexity in the sense of multiple possible points of connections abundance affords. In sum, this implies the development of skills that are reflexive; that is skills that juxtapose the expanding affordances of the web with structuring and narrowing abilities.

The nature of the phenomena and the strategies for selection may be described as follows in a simplified form in the figure below.

Figure 1:

Characteristic of the web	Problem	Selection strategies
Amount/abundance of information Multi medial information and hyper structures Several parallel applications	Navigation, movement, direction and overview How to keep continuity, coherence and closure. Amount Mastering multitasking Issues of information retrieval: selection, validity, Time consumption	Evaluation of web sites(what gives credibility): compare and contrast Evaluation of web site/URL: Developing reading strategies (i.e. close reading, skimming) Parallel assignments Expand time on task

Indeed, this is truly a constructivist way of learning. In sum, this represents a high demand on the skills and abilities the learners, skills that have not been prepared and that need to be developed on the fly.

4.2 Example 2: Digital voices from secondary school

The following examples are from the Learning Network 2006 – 2008 Project in South Trøndelag County, a project that challenges learners to produce 'compound texts'. The learners spend little time on mastering the technology in a traditional sense. Instead their work is characterized by an ability and willingness to be alert and prepared.

4.3 The Apocalypse Dudes

The Apocalypse Dudes is a film made by five boys in the 10th grade, and extracts will be shown during the presentation. Their assignment was to make a project in music where they combined music and pictures. The film is a collection of sequences where the two main persons (the Dudes) watch various TV clips, varying from MTV to News of the World. In

these clips the learners mix news clips with extracts from computer games, sound and images, and word processing. Multiple technologies are used, and the learners communicate through several semiotic layers.

4.4 Lemon Tree

This example is a variety of the music video genre. Six girls changed on being in front of the camera. The structure and the narrative follows the song Lemon Tree, and key words like *lemon*, *lonely*, are emphasized in scenes throughout the video. Technically the video is not very advanced, but more important is the utilization of elements from different genres from films and TV, such as slap stick comedy, silent movies, and the MTV style music video.

5 Summarizing examples from the empirical material

Finally we may attempt to summarize how the different artifacts may be classified and characterized. The table below is an attempt to identify the development of tertiary artifacts and how these rest upon and are dependent on the primary and secondary artifacts. In the empirical material consulted in this paper it is conspicuous that training or instruction using the tools is almost absent. The development of advanced skills and competences has its origin in the nature of the assignments, the agenda of the learners and how the affordances of the given technologies are appropriated. The skills go beyond mere mastery of the technology itself. By identifying the different levels of artifacts we also One of the most important aspects in these projects is to observe how the learners re contextualize existing resources into new products, their keen eye for genre and the humorous application of genre characteristics. However, most interesting in the body of material consulted we see a development that may be connected to central aspects in the classic *Bildung* literature (von Humboldt 1793, Gadamer 1975, Klafki 2001). In this tradition emphasis is made to the individual interplay with the surroundings, '*in freiesten Wechselwirkung'* (von Humboldt 1793). Gadamer distinguishes between *Schulbildung*, that is education which is already created, and *Sich Einhausen*, which is a process of *Bildung* in which the individual makes himself at home in the world. In the same manner, Gadamer emphasizes the 'self-education of education' (Gadamer 1975, 2001).

In this material we perceive the emergence of such processes in which the learners are in the development of increasingly sophisticated artifacts that signal the movement from *Schulbildung* through *Sich Erziehen* (to educate oneself) towards *Sich Einhausen* (to make onself at home in the world). In the process we also see that the learners develop skills and establish areas of knowledge that do not have a clear relevance to the educational system as yet.

The figure below condenses the way we may perceive the primary, secondary and tertiary artifacts, how they are realized in these examples from the field and what their relation and relevance to the educational system are. The overview suggests that the literacy skills developed here are many faceted and highly complex, and developed on the fly. Increasingly, they become higher level cognitive skills that demands a high level of reflection on the learner's part. The figure also suggests that the primary and secondary level artifacts represents the interests of the educational system, as this is reflected in for example the Norwegian Knowledge Promotion. From a *Bildung* perspective this is focused on factual knowledge, or encyclopedic knowledge. Or in other words, what Gadamer terms *Schulbildung* (Gadamer 1975). The external influences of the global youth culture, partly

from the web itself, offers an arena of self-education, where the traditional *what* of knowledge construction is expanded to include the *how* and the *why*. As such this is a process of *Didaktik* and *Bildung* that the learners initiate and take part in. In Gadamer's terms, the learners here transcend the confines of the established and pre defined knowledge (*Schulbildung*), and through a process of self education (*Sich erziehen*) they make themselves at home in the world, by critically *reading the world* (Freire and Macedo 1987).

Figure 2:

Level of artifact	**Description – realization**	**What is learnt/ developed where? Relation to educational system**
Primary artifacts	**Definition**: Use of knowledge stored in tools: Web browsers, Word, Power Point, editing tools for video (Movie Maker, Fraps, Sony Vega 7.0, Battle Recorder. **Examples**: PP presentations, use of Word, use of browser for information retrieval, use of editing tools for video, etc.	The school's area of interest. Focus on factual knowledge. Focus on tool aspect of technology Expressions of the focus and interests of the educational system Oriented towards *Schulbildung*
Secondary artifacts	**Definition**: Social models for use of tools. Presentation and transfer of skills. **Examples**: Knowledge distribution and sharing of primary artifacts. LAN as work form. Knowledge sharing of elements from computer games.	
Tertiary artifacts	**Definition:** Changes in how practices are organized and performed, changes in the ***what*** and ***how***. Towards new content, new expressions and new language. **Examples:** Strategies for selection: from knowing ***what*** towards knowing ***how*** Selection based on criteria of reflexivity Selection based on faced value, compare and contrast, establishing of different knowledge domains, defining criteria for validation. New content: construction of content that reflect the Lebenswelt of the learners Explorative, associative learning style, iterative learning processes Development towards a new vocabulary, new language Learning as expression of identity – development of personalized expressions Re contextualizing of resources into a new content Re contextualizing of resources into new modes of expression Experiences from media as resources in new content and new expressions	Developed with basis in a global youth culture. Focus on technology in social practices From *Schulbildung* through *Sich Erziehen* towards *Sich Einhausen*

6 Concluding comments – towards a re description of literacy

The situation we have described above is extremely challenging to the educational system. We have here attempted to show the implications of a different perspective of technology by focusing upon the actual practices that are being developed. The theoretical perspective attempts to move beyond a utopian-dystopian dichotomy. Instead, a more pragmatic approach is suggested. Technology is that which emerge in a process of co development between man, intentions and agency, and the technology at hand. This perspective upon technology is largely different from that which is the basis of the governmental initiatives throughout Europe.

The nature of the competences and skills developed is conditioned on the fact that learners participate in several arenas relevant to education and *Bildung*; the home, school, peer groups, all of these increasingly connected to the web based applications and digital tools. As the governmental initiatives have been described previously, their concern is primarily with literacy connected to the primary and secondary artifacts.

The digital learning environments are best characterized by their abundance, the richness in affordances and opportunities to communicate, to build relations and to have access to information resources. The very abundance of the web creates complexity, and we have seen how learners develop strategies for selection and for construction their own content. To fully appreciate the nature and depth of these abilities we have distinguished these into primary, secondary and tertiary artifacts.

The literacy developed to arrive at the tertiary artifacts is not a topic in the governmental description of 'digital competence' or 'digital literacy'. The present material gives some indications as to what components need to be included in a re described understanding of literacy.

Some researchers have introduced terms such as multi literacies and digital literacies (Warschauer 1999, New London Group 1996, Tyner 1998). These critics split literacy into visual, numeric and network literacy, referring to the abilities needed to master different realizations of sound, text, image and video. These are skills and abilities connected to tools or to applications. While this is important, it is not sufficient.

Günter Kress distinguishes between a past and a future understanding of literacy (Kress 2000a, 2000b). According to Kress we may distinguish between the 'world as told' and the 'world as shown'. The first refers to how each of us connects to what has been, and takes a place within a tradition. The latter refers to the creative, to reflection and to what he terms design. Design, the ability to create an overview over a creative and reflexive process. Gilster follows this argument when he introduces the idea of 'knowledge assembly', which is all about building perspective (Gilster 1997). As we have seen the tertiary artifacts developed by the learners point in the direction of design and building perspective as main characteristic. We see in this material that the learners re contextualize their experiences from the media, and in the process develop a critical distance that both represents a level of tertiary artifacts, and approaches elements of *Bildung*. The school is positioned in the centre of tension between on the one hand the 'true' cultural heritage, and on the other an individual understanding of what knowledge is. The argument presented here is that the debate revolving around 'digital literacy' and 'digital competence' will need to be augmented with the perspective of *Bildung* as this is expressed in the emerging practices we find in youth culture. This kind of literacy is characterized as a compound literacy, feeding on several sources in addition to the traditional

literarcies. In the web-based projects we see the development of emerging selection strategies that is needed to deal with the complexity and contingency of the web resources. The selection strategies are needed in order to distinguish between different types of information, to verify information, and how to develop content based on information that can be trusted. In the two other examples, the learners demonstrate a high degree of technical mastery, as well as a keen understanding of the modern media genres. Moreover, these are appropriated in a playful, almost carnevalesque way into new expressions, in a new language and constructing new content.

The challenge presented to the educational system implies to open up to and include the competence developed by the learners themselves. The literacy found in the tertiary artifacts need to be re contextualized and include this into a tradition for further development.

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References:

Bakhtin, Michael (1981): Discourse in the Novel.
In: Bakhtin, M. M.(1981): The Dialogic Imagination. Four Essays By M.M. Bakhtin. Ed: Holquist, Michael. Translated by Caryl Emerson and Michael Holquist. Austin: University of Texas Press.

Bovill, Moira and Livingstone, Sonia (red) (2001): Children. Young People and the Changing Media environment: A European Comparative Study. New York: Lawrence Baum.

Drotner, Kirsten (2001): Medier for fremtiden: børn, unge og det nye medielandskap. København: Høst &Søn.

Feenberg, A. (1999): Teknikk og modernitet. Oslo: Universitetsforlaget. See also: http://www.sfu.ca/~andrewf/ Freire, Paulo and Macedo, Donaldo (1987): Literacy: Reading the word and the world. South Hadly, MA:Bergin and Garvey.

Gadamer, Hans-Georg (1975): Truth and Method. (Translated by G. Barden and J. Cummings). London: Sheed and Ward.

Gadamer, Hans-Georg (2001): Education is Self-Education. In: Journal of Philosophy of Education, Vol 35, No. 4, 2001.

Gibson, J. (1979): The Theory of Affordances. The Ecological Approach to Visual Perception. Boston: Houghton Mifflin.

Gilster, Paul (1997): Digital Literacy. N.Y.: John Wiley & Sons, Inc.

Johnson, Steven Berlin (2001): Emergence. The Connected Lives of Ants, Brains, Cities and Software. London UK: Penguin Books, Ltd.
Kelly, Kevin (1994): Out of Control. The New Biology of Machines, Social Systems and the Economic World. New York: Basic Books

Klafki, Wolfgang (1985, 2001): Dannelsesteori og didaktikk. Nye studier. Århus: Forlaget Klim.

Kress, Gunter (2000 a): Design and transformation. New theories of meaning. In: Cope, Bill and

Kalantzis, Mary (eds.) (2000): Multiliteracies. Literacy Learning and the design of social Futures. London and New York: Routledge.

Kress, Gunter (2000 b): Multimodality. In: Cope, Bill and Kalantzis, Mary (eds.) (2000): Multiliteracies.Literacy Learning and the design of social Futures. London and New York: Routledge.

Nardi, Bonnie and O'Day, Vicki L.(1999): Information Ecologies. Using Technology with Heart. Cambridge, Mass. and London, England: The MIT Press.

Negroponte, Nicholas (1995): Being Digital. New York: Vintage Books.

Postman, Neil (1992): Technopoly: The Surrender of Culture to Technology. New York: Alfred J. Knopf.

Tyner, Kathleen (1998): Literacy in a Digital world. Teaching and Learning in the Age of Information. Mahwah, N.J.: Lawrence Erlbaum, Inc.

Tapscott, Don (1998): Growing Up digital. The Rise of the Net Generation. New York et al: McGraw-Hill.

Van Lier, L. (2000). From input to affordance: Social-interactive learning from an ecological perspective. I: J. P. Lantolf (ed.). (2000). Sociocultural Theory and Second Language Learning. Oxford: Oxford University Press, pp. 245-60.

Von Humboldt, Wilhelm (1793/2000): Theory of Bildung. In: Hopmann, S., Riquarts, K. and Westbury, I. (eds.): Teaching as a Reflective Practice. The German Didaktik Tradition (pp. 57 – 61). Mahwah, N.J: Lawrence Erlbaum Associates.