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Reading in the Future: Literacy and the Time of the Internet / David R. Cole

Abstract: David R. Cole's "Reading in the Future: Literacy and the Time of the Internet" locates the literacies of the internet – itself read as "the end game of western technology" or the *Machina Mundi*, the Great Chain of the World that has a centre that is everywhere and a circumference that is nowhere – in a contradictory space. But Cole also self-consciously locates his own writing at a moment in time when the initial technological hype of the internet is subsiding in the face of the boredom of informational overload and the internet is emerging as both an "unlimited realm of resource" and the site of a brand of "western nihilism containing a sense of relativism, collapse of meaning and cultural schizo-cynicism". Remarkably, in the course of his argument, Coles does not appropriate the internet, does not simplify it according to his own vision of its potential or mission – but allows it to remain a place of cultural schizophrenia, to be navigated only by means of the corresponding learning, acceptance, and practice of "schizo literacy".

Eternal Return

In fractal mapping - like the famous Mandelbrot Set, that supreme fashion hieroglyph of the 1980s - the basic pattern keeps repeating itself, ad infinitum apparently - the deeper & more enfolded you go, the more it repeats - till you get tired of running the program. After a certain amount of time, you might say, the fractal appearance has been theorized more or less satisfactorily. No matter how much more exploitation of conceptual space occurs, the structure of the space is now *defined* for all practical purposes. Hasn't something similar happened with the Internet? (Bey 1997: 152).

<1> The initial technological hype of the internet is subsiding as the ennui of informational overload begins to become apparent. It could be said that the internet signifies more than just the dream of educational technologists in terms of an unlimited realm

of resource; it is also the pretext for a brand of western nihilism containing a sense of relativism, collapse of meaning and cultural schizo-cynicism. As an exemplar of a perspective that deals with the educational consequences of this nihilism, Patti Lather has described the dénouement of the Enlightenment, positivism and secular humanism, in the post-modern scene (Lather 1991: 86-101). Following Lather, it could be said that human reason as it has been rigorously defined in the west through science, and the will that this has engendered, has undergone a series of involuntary changes; scientific male, phallocentric thought has begun to explore its foundations for the puissance to encounter as yet non theorized categories and institutions. Through her research and writings, Lather has attempted a reconciliation of the grounds for education (though not male rationality) through deconstruction of the assumptions for research, and the treatment of scientific method as fiction and text (Lather 1991: 91). Lateral thought of this type is useful in that the authority of scientific education may be transferred away from the linear transmission of knowledge, and taken into contextual moments of critical inquiry. Yet, in a similar and parallel manner to the ways in which the deconstruction of Derrida may lead to the continuous lateral questioning of textual reference in order to discover the self-sameness of logos; in the case of Lather, educational authority may loop back and become embroiled in the text through the conjunction of simultaneous fictions that explain the functioning of post-modern educational power. In other words, the recursive action of fictional analysis reconstructs and reconfigures the power of the word through learning about text. This paper does not tend towards such a movement because the collapse of textual meaning is not the object of analysis. To state the point directly, this paper shall explore the literacy of the internet through an understanding of the particular time-based qualities that the internet has to give to the learner when they are reading.

The advantages and disadvantages of hypertext

<2> However, it is propitious at this point to question the authority of the text of the internet in terms of the literacy that it might produce. This process of questioning involves the unveiling of the power relations that the electronic medium has negotiated. George P. Landow has figured this problem in terms of the convergence of hypertext and critical theory, and the replacement of conceptual systems founded upon ideas of centre, margin, hierarchy and linearity with ones of multi-linearity, nodes, links and networks (Landow 1992: 2). Using the work of Derrida, Theodor Nelson, Roland Barthes and Andries van Dam, Landow suggests that the convergence tendency of the electronic medium is an introduction to new modes of thought which shall become as important as the reading of narrative became through the technology of the printing presses. These modes of thought define a restructuring of time, and prepare us for a complex, non-linear time, where the acceleration in literacy learning on the internet is one of a gamut of survival techniques present in the vernacular of global post-modern capitalism. Landow and his associates have carried out research into this field, and report that students at the university level develop lines of "asynchronous communication" during their courses conducted through hypertext (Landow 1992: 132). This communication preserves the structure of the courses whilst dispensing with the pressure of deadlines, or pre-set scheduling procedures. Students learn in an atmosphere of continuous discussion and project linkage, with hypertext documents serving to make the study of text a non-linear process of cross-referencing and the exploration of a plethora of connected material. These hypertext

courses took on a different aspect to the presentment of isolated and studious competitors, attempting to take out limited numbers of books from the library on one subject at the same time. The real-time (and stored time as artifact) linking of the students meant that ideas could be shared during their development, and projects could be left or restarted depending upon answers to questions, or the settlement of discussion (Shields & Bader & McQuillan & Beeman 1988).

<3> The implications for higher education are clear if such pilot projects were to be extended. Students would learn about internet literacy more broadly and they would produce work in a more communal atmosphere on the net. Positions of difference could be rigorously maintained through discussion, topics could be brought into line with the desires and interests of the students, rather than being dominated by the wishes of the academic designing the course. Evaluation in this context clearly cannot be a summative, but involves the immersion of the student in a process of collaboration. The roles of the students, teachers and any other participants who might become involved in the literacy learning unit, result in an energy centre for the transmission and reception of code. Internet learning micro-cultures are beginning to be understood (Plant: 1996), though the translation to recognizable cultural formations is blurred by the potential for camouflage and piracy, which the electronic medium affords. Non-linearity begins to take on real force when it is not merely consigned to the scrambling of the code of the text, but it is also a part of the life choices of the participants in the process. Contrary to Landow, who begins to sound like a salesman for all things non-linear, and tries to position himself as the instigator of complex hyper-textuality, (and there is undoubtedly immense potential here). We must not allow the time of literacy on the internet to subsume or dominate other learning paradigms, or, put another way, we cannot move to enforce a grand narrative of non-linear literacy learning at the expense of the actual life choices of the players caught in the systems of internet literacy.

<4> Ted Friedman, for example, notes that hypertext is a transitional genre particularly appealing to literary academia because it dresses up traditional literary study with post-modern multimedia flash (Friedman 1995: 74). Dull literary courses may be given the appearance of relevance and current style through the presentation of ideas in hypertext. The authority of the linear narrative is questioned by this procedure; however, the production units of hyper-textual critique are also ideal places for students to be carried through the system without interacting with the text in question. The agents in these courses may become discouraged due to the intensity of communal scholasticism. Reading immense amounts of cross-referenced and inter-connected publications, as Landow suggests, extends the linearity of the narrative form of literacy through non-linear acts. On the contrary, the internet offers much more than protracted reading projects, in that it introduces the student to a maze of contemporary artifacts. The interactivity of hypertext learning is linear due to the fact that it produces and reinforces a narrative structure of reading and writing. The non-linear learning structure of the internet incorporates heterogeneous elements such as video, music, VR environments, graphics, as well as screens of text. The non-linearity of learning is dependent upon the feedback system that is produced between the student and the material. The complexity of the feedback on the net does not result in simple extensions of linear methodology (i.e. reading and writing exercises), but introduces the students to other worlds of complex non-linear literacy.

The *Machina Mundi*

<5> The cutting edge of the internet are the other worlds; they represent the science fiction of the digitized medium, the sites where the future collides with the chaotic present. The communications systems connected to the internet present perhaps the most powerful technology that has ever been invented. In a sense that has never before been understood, the internet reverses the relationship that humans have with technology. It could be said that it is no longer a question of humans inventing technology, but of technology reinventing the human. In particular, reinvention involves the way in which humans communicate and the communicative resources that humans have to define themselves (Ansell-Pearson 1997: 152). Reinvention may be understood through the many escape routes from the constraints of sedentary society that the internet affords. The space for literacy learning on the internet opens up a complex, non-linear time that does not totalize or accumulate experience, but places it through the maelstrom of accelerated dimensions. This is the chaotic material space where chronological time breaks down. The chaotic material space cannot be eternalized into a Platonic heaven, or reproduced as perfunctory knowledge (the internet is not a library); on the contrary, the space of the internet coheres the glutinous remnants of intellect and desires driven by excess (proto-materialist libido). In other words, the cybernetic machine that the internet is a vital segment of is an immense system of constraint, turned into a hierarchy by economics and shaped by flows of communication and capital (polarization). To challenge this machine in terms of the literacy learning parameters of the net is to move the pragmatic and theoretical emphasis away from its automatic binding elements (capitalist control), and to enter into a fluid relationship with the spaces left by repetition and by control (virtual terrorism).

<6> It could be argued that the literacy of the internet is by analogy the end game of western theology. Nicholas de Cusa conceived of the notion of the *Machina Mundi* in terms of the Great Chain of the World (1440), with a God that was not separated from nature, but was an intrinsic part of it as steersman (Greek, *kubernets*) or governor (Latin, *gubenator*). This *Machina Mundi* has a centre that is everywhere and a circumference that is nowhere, for God is its centre and circumference and God is everywhere and nowhere (Cusa: 1997). The Great Chain of medieval theology that de Cusa theorized, operated as a hierarchy of constraints, governing various subsystems, including human society, within an organically organized whole. The ultimate constraint on all communication in the system (production, reproduction, exchange, maintenance, interaction) is embodied in the mysterious principle called God. Anthony Wilden has argued that God in this system is a metaphor, and taken seriously as a metaphor, it symbolizes the ultimate constraint on all past, present and future behavior on the planet; this constraint we now call entropy (Wilden 1997: 225). Wilden contends that entropy is qualitative as well as quantitative, depending on "the qualitative signification of a chosen relation between order and disorder" (Wilden 1997: 226). Entropy is a characteristic of arrangement, the arrangement of God being the maximum concordance of differences, (*De concordantica catholica,* 1433); total entropy is also achieved when a system is described as having all differences equalized. Wilden contrasts the hierarchically constrained universe (a simple ecosystem), from the linear or efficient causality that is assumed to operate in the isolated, mechanical, equilibrium systems of a Newtonian universe.

<7> Using the notion of the *machina mundi* to analyze the literacy of the internet, we may perceive how the theology of the whole, that requires an unmoved mover, is a metaphor for the stasis of the system, and this allows us to access an overview of the form of constraint that the organization defines. Global, late or post-modern capitalism, that is accelerated and defined through its communication systems, provides the pretext for understanding the post-modern shifts in control, down to semiology, literacy and social relations. However, this analysis does not provide meta-statements as Wilden hoped. This is because the gap or space between the representation of capitalism and capitalism *qua* capitalism is unrepresentable as capitalism circumvents linear development. What we are left with are the coding techniques of global capitalism on which we may perform a destructuralization in terms of the forms of constraint that have been set in place in order to control the literacy learning process. The digital medium of the internet, where signs are reversible, dispersed and in many ways viral, substantiates the claim that the cybernetic equation of the global communication system acts in such a way as to simultaneously provide almost total control of any communicative interaction (tracking) and release from intentional face-to-face interactivity (digital camouflage). It is also the space in which the unconscious surges, and where agents may learn about digital literacy, also termed as "selective exposure" (Foster 1997).

Computer Mediated Community

<8> The mapping of the coding techniques of post-modern capitalism, and the constraints that this imposes upon literacy learning on the internet, presents a complex arrangement of signs and relations in time and space (local interactions leading to universal interruptions). The time of the internet incorporates a form of communication that resembles an immense digital marketplace, selling everything from people to software, from holiday homes to maps of the moon. This gigantic commercial enterprise never rests, it depends entirely on the interest generated from the identity and the design of the web pages, and has a quick turnover of sites and innovation as companies go to the wall or servers are not maintained. Agents learning on the net encounter multiple inducements to part with the details of their credit cards, and are able to satisfy their desire for products not readily available in their local neighborhood. Marshall McLuhan (1964) would have considered this aspect of the internet as being hot media. The commerciality of many parts of the net initiate a type of dumbing down of the agent, and a passive acceptance of uncritical desires. The lack of imagination that this type of media may induce does not bode well for creative education (in terms of produced artifacts). However, the motivation to learn about literacy is galvanized by using the internet, as specific desires are focused and brought to the surface of the learning activity through the use of a digital medium to discover information. The quality of striving in learning, which is known as conation is strengthened by the use of the internet as the access to information is increased. Kathryn Atman has argued that conation is one of the principal factors that determine success in distance learners (Atman 1987: 14), and learning literacy on the net may be placed into the category of multi-directional distance learning.

<9> The *machina mundi* of the internet constrains the learner in terms of being driven by post-modern illusion (capitalist entropy), but rather than this signifying ultra-modernism or the extension of the senses that McLuhan has theorized, this constraint defines a space for difference in terms of cultural

artifact. The increasing ease of the production of web sites means that agents will be able to actively transfer their desires into individual or collective electronic creativity. Steven G. Jones has looked at this development in terms of a socially constructed space and the post-modern geography that it entails (Jones 1989: 10-35). Jones has located the need for new notions of community as the old ones break down, and points to the fact that we are now able to create community technologically. As society moves in this direction, education benefits from what has been termed as the "rhetoric of the electrical sublime" (Carey 1989: 23), whereby the investment in electronic hardware is touted as the solution to social problems. Booting schools up with computers, in these terms, is a simple political fix to broader social problems, since it could be claimed that the social space that is created on the net does not equalize the differences in societal wealth as a whole. The social space that is constructed on the net is highly illusionary and virtual, and it does not address issues of the permanent underclass. Jones questions the authentic nature of the cyber-society created through computer mediated community (CMC), as it is basically a *use* of space and time, rather than being an abstraction in space and time, which was the case in society constructed before technology allowed for extensive mediation (Mumford 1934). The CMCs are characterized by a fluidity and mobility (and not place), in that the constructed social space does not remain fixed in narrative terms or in the terms of the status of the participants in its fold (the literacy of digital nomadism).

<10> Jones, paraphrasing Carey, puts many of the claims about the new cyber-society down to the "mythos of the electronic revolution" (Carey 1993: 171), where the fidelity of cyber-spatial social relations is kept as an analogue to physical social relations, and a false homology is made between the two (Jones 1989: 19). This could also be applied to many of the claims about new literacies or multiliteracies (Cope & Kalantzis 2000) that are developing due to the explosion in electronic communication. Jones argues that this action misunderstands the notion of community by replicating the rhetoric of the fascists, who built a deeply divided and oppressive society through technology and social production, and called it community *(Volk)*. On the net, in conceptual terms, the technology is not so much a space for community, as a passage point or medium for the ritual sharing of information (Stone 1991: 81-118). Social scientists have found it extremely difficult to define community precisely, falling prey to the commonly known errors of instrumentalism, and the replication of subjective belief (about community) in objective study (on community). At best, communities may be understood as complexes of variable social relationships and ideas, yet they escape identification of vital character or structure (from the outside). Jones identifies the need for the conceptualization of space and the social, and the inquiry into connections between social relations, spatial practices, values and beliefs. The ability to create, maintain and control space, whether it is virtual, non-place or net-world, links us to notions of power and necessarily to issues of authority, dominance, submission, rebellion and co option, which Etzioni(1991) has established as primary criteria of community and is immanent in the production and maintenance of the literacy of the internet.

Power on the net

<11> The identification of communal power relations on the net, however, does not bring us nearer to the unconscious learning and particular literacy that will proceed there. It is not clear how

the struggles of history, and the formation of tumultuous
communities, are going to be uploaded into cyberspace on the
large scale. Whilst the interactivity and power relationships of
the new media cannot be denied, the question remains as to
whether they will lead to communities vying for power in ways
which reflect this media, or whether processes which have already
shaped history shall be repeated on the web. Currently the
commercial wars among servers, O/S mediums, software designers,
PC manufacturers and dot com companies, are primarily a technical
sparring to fill out the needs of the market for cheap and
reliable access to the internet and an adequate choice of useful
and interesting services. The feedback for real communities is a
leap into the science fiction of the social. It should be noted
that, the emergent culture of the net inscribes a pre-written
space in contrast to literary culture, and that digital literacy
learning will take place in this space to accelerate the
processes of inscription. This pre-written space, however, has
not lead to idealized tribal village communication as Howard
Rheingold has suggested (the electronic village), but points more
obliquely and disparately to the hunters and gatherers in the
electronic media (Meyrowitz 1986).

<12> Notions of the electronic village or community of computer
mediation, derive in part from the understanding that the
internet is the end game of western theology. By tending towards
the whole, it is possible to conceptualize the equalizing of
difference in a fully entropic global communication system. Yet
the tendency towards the whole is also an escape route from it.
The political forces that have placed the internet into the
classroom as an educational tool, cannot predict the literacy and
outcome of this placement, as the students learning on the
internet will not conform to the same forces as their placement
(it is a complex non-linear arrangement). Allan E. Goodman (1993:
56) has predicted that the computerization of the classroom will
lead to its deconstruction as a formal structure. The variously
formulated virtual classrooms have taken similar lines into the
future in that they have extended ideals of choice, and have made
literacy learning a lifelong occupation to be married with work
or play. In this case, agents placed in these technological
settings of the future benefit from a universally wired and
interactive society. However, beneath this ideal structure, lie
the power centers where real people exist and desire, even if
more of their daily experience is mediated through computers.
Deleuze and Guattari have provided an analysis that engages with
these micro powers:

Each power centre is also molecular and exercises its power on a
micro logical fabric in which it exists only as diffuse,
dispersed, geared down, miniaturized, perpetually displaced,
acting by fine segmentation, working in detail and in the detail
of details. Foucault's analysis of disciplines or micro powers
(school, army, factory, hospital, etc.) testifies to these
focuses of instability where groupings and accumulations confront
each other, but also confront breakaways and escapes, and where
inversions occur. What we have is no longer, The Schoolmaster but
the monitor, the best student, the class dunce, the janitor,
etc.....We would not say that the proper name loses its power
when it enters these zones of indiscernibility, but that it takes
on a new kind of power.....And every power centre has this micro
texture. The micro textures -not masochism- are what explain how
the oppressed can take an active role in oppression: the workers
of the rich nations actively participate in the exploitation of
the Third World, the arming of dictatorships, and the pollution
of the atmosphere (Deleuze & Guattari 1992: 224-5).

<13> It is on this level of micro-organisation that the changes due to the time of the internet are happening. There is not a conscious non-linearity occurring as direct positive feedback due to the electronic circuitry (except perhaps in populations deprived of the technology); the non-linear process is more concretely, an unconscious restructuring of the micro texture of the power centers within it. In contrast to the dualism of the public and the private or the political and the personal; the time of the internet presents a non diachronic investment in heterogeneity. It could also be said that the machinic phylum of the internet is a focused instability, which implicates communication and intelligence with a bizarre range of new powers that have direct implications about our notion of literacy. The ability to access immense amounts of information, to perceive extremely idiosyncratic desires and to examine the cultural artifacts of the electronic herd; all point to new forms of internet literacy. Jerome Bruner has expertly presented the difference being drawn out here, when he said that, "the ways of the mind are enabled, indeed often brought into being, by learning to master what has been described as a culture's toolkit of symbolic systems and speech registers. There is thinking and meaning making for intimate situations different in kind from what one uses in the impersonal setting of a shop or office" (Bruner 1996: 25). This is precisely what the internet does not provide. The symbolic systems and speech registers are obviated or at least rearranged, and they are replaced and overlaid by non-situational complexities of undirected inscription. The unconscious literacy learning of the internet, therefore, does not provide a training ground for the mores of sedentary society. The proper name (the personal project and consequent symbolic register), towards which the student of Bruner would strive, is dissolved beneath a host of micro-textual and avataristic internet identities and power.

The distinction between form and expression

<14> Gilles Deleuze (1992: 280-294) has complained about the incessant chatter of undirected speech that arises from mediocre cultural production, such as the French literary TV program *Apostrophes,* or the omnipotence of boring couples, or formulaic novels written by journalists. He claims that if literature is going to die it will be by assassination, as the conformity of production for the market will subsume creative forces, and no one will notice singular creation (that is not represented in the market). Audio-visual production does not replace literary production in these terms, but suffers from the same reduction in creative possibilities that bowing to a mass market engenders. The internet particularizes a similar movement towards hyper-commercialism, which is precisely why strategies that unfold the time of the internet in terms of singular educational pursuits and an identification of internet literacy, are a creative necessity for computerized learners. The prizing apart of thinking and meaning making as, for example, Bruner proffers, does not take place on the internet in terms of a situational or contextual analysis, which enables systematic and specific skill-learning. Instead, the literacy learning structure meshes and spreads instantaneously through the virtual and the non-directed. The micro-textures present in the power structures of the internet process this procedure, and allow its dispersal in terms of information, and information about the information, *ad infinitum*. In these micro-textures there are unprecedented opportunities for zones of indiscernibility, where identities circulate and information loses its meaning (as to who benefits from it and its intentionality). Concurrently, the results of the analyses of modernist power structures in the manner of Foucault

lose their rhetorical placement as post-modern or detectable as such; they are merely layers that we may increasingly put on top of one another when we are talking about literacy on the internet.

<15> However, it is futile to define the time of the internet with post- {x}, as if the mediated future disavows the past. Douglas Englebart's (1962) vision of human intellect being augmented through technology depends upon the system of power that the technology defines. For example, Alvin Toffler (1970: 360-386), looked into the future, and saw global capitalism determining a new genre of education that would replace the factory skills of the past with the flexibility necessary for jobs in high technology (information and control). His predictions regarding super-industrialism combined with councils of the future to speculate about curricula and teaching methodology, assume that the extension of control shall permeate in the social direction of hyper-industrialism; and he subsequently frames worrying possibilities such as the educational use of smart-drugs to enhance IQ. Some industrialists would undoubtedly concur with several of these predictions, and the merging of education and industry, especially in higher education, has transpired along some of the lines that Toffler predicted, leading to a stark division between those advocating an arts based approach to education and those siding with industry. Studies such as, *The Information Society,* by William J. Martin (1988), confirm the movement of control throughout society, by pinpointing the flows of information at each conjunction. With information packaged and processed into any shape that it could ever take (through digital convergence); systematic regulation of any communication and therefore literacy becomes possible. This is because a form is discernible that connects the most innocently naive utterance to intelligence secrets at the heart of governments (communicative continuity). Information theorists work under the assumption that universal units of information (bits), flow like electricity to animate the circuits that they visit. Yet the quantification of information is not directly analogous to the quantification of energy; whilst both mechanisms serve objectified ends, the means of production (an energy plant, and a state system) are clearly divergent.

<16> Governments do wish to capture, regulate and control the literacy and the flow of information present on the internet, but the raw material of the net is cultural production (the bit is a tool); which can extinguish or expand the distinction between expression and content. At the furthest extent of rigorous (Newtonian mechanical) scientific discourse, the distinction between expression and content is at its strongest, and the bits of information are clearly definable and able to be used in formal situations (literacy=verifiable truth). In the confused communicative arena of the net, where power approaches a micro-texture, and the focus of instability designates a zone of indiscernibility; content and expression are merged, and they are translatable onto a smooth plane of digital interaction (literacy=flux). The distinction between expression and content is not only merged, it is also complexified. The duality that exists between formal expression and folk psychology dissolves, beneath a bewildering array of communicative possibilities (digital synthesis). The linguist Louis Hjelmslev untied the duality between expression and content by "weaving a net out of the notions of matter, content and expression, form and substance" (Deleuze & Guattari 1992: 43). The unmetaphorical net of post-modern communication technology does not only have implications for language, but permeates society and literacy, or the strata of society as Deleuze and Guattari term them with

reference to geology. It is clear from the work on emergent communities on the net, that the complex movements associated with the new media are sufficiently differentiated to be stratified, yet this stratification also forms intricate cross-over points, through which there exists the possibility of an undifferentiated plane. Hjelmslev termed this plane as matter, Deleuze and Guattari use the expression body without organs, and digitalization creates its own singular plane of interactivity through which we may encounter the literacy of the internet.

The literacy of quantum materialism

<17> Hjelmslev's net leaves no ground for dualism between expression and content, as he utilized all the resources of real distinction, reciprocal presupposition and general relativism, to define each in their mutual solidarity as opposed (relative) functives of one and the same function (Hjelmslev 1969: 60). In so doing, the space is produced to theories matter in a quantum universe and the medium of the internet for literacy. Echoing the quantum mechanics of Niels Bohr, the relativisation and implication of any procedure (in others) concerning the plane of matter - is the "unformed, unorganized, non stratified or de-stratified body and all its flows, for example, subatomic and sub molecular particles, pure intensities, pre-vital and pre-physical free singularities" (Deleuze & Guattari 1992: 43) - and this makes it possible to de-structuralize the work of procedure. Niels Bohr was concerned with the distinction between the scientific observer and the phenomena under scrutiny, and the fact that any *interaction* between measuring devices and that which is measured, defines a quantum relationship. Bohr speaks of the impossibility of any "sharp separation between the behavior of atomic objects and the interaction with the measuring instruments which serve to define the conditions under which the phenomena appear" (Bohr 1987: 39-40). This irreducible interaction does not form a unity between observation and phenomena, governed by a classical economy of synthesis, but it defines a complex and shifting *complementarity* (Plotnitsky 1994: 103).

<18> The complex complementarity from Plotnitsky and Bohr, where the procedures and methods of investigation are rigorously implicated in the matter of investigation (and escape routes from it), define an educational stance for understanding the literacy of the internet. It is a relative stance, and in no way does it define a non-theoretical or 'mystical' space which defeats the interruptions of investigation, but, as Bohr elaborates with relation to physics, "the notion of complementarity points to the logical conditions for description and comprehension" (Bohr 1978: 91). The conditions by which investigation into the literacy of the internet is possible, require that non-directed, unorganized, subconscious particles of learning are 'mapped' on a field that does not attempt to solidify this fluidity into structured methods of comprehension. Similar in kind to the discoveries of behavior at the subatomic level, where particles exhibit complex non linear behavior in time and space, the literacy of the net does not need abstract models for its comprehension, but rather channels of complementary theory that turn in swathes with the transitory and ubiquitous formations of internet students. The procedure of investigation into the literacy of the internet cannot be seen to impart stratified notions that are not implicated in the undifferentiated mass of the net. This is because closed systems of theoretical placement would be subsumed by the complexity of the communication involved, and the irreducible gap between the notion of net understanding, and the processes of the net themselves.

<19> To this extent, the quantum materialism of the net opposes metaphysics. As a dynamic field of investigation, the internet is a real formation of power centers, material transaction and literacy learning about the future. In his study of emergent net culture, Manuel Castells (1996) has integrated the informational mode of development with the modes of production in their historically determined heterogeneity of institutional arrangements. The most distinctive result of this investigation is the theorization of what Castells has called "the space of flows" through integrated global networks. The space of flows is described as having at least three layers that are: 1) Technical: the circuit of electronic impulses (the microelectronics, telecommunication, hardware in general) that form the technological infrastructure of the network. 2) Geographical: the topology of the space formed by its nodes and hubs. The networks define hubs that link it to specific places under definite social and cultural conditions. Nodes are the "location(s) of strategically important functions that build a series of locality-based activities and organizations around the key functions of the network" (Castells 1996: 413). 3) Social: the spatial organization of the managerial elite using the network.

<20> Castells uses the ideas of timeless and placeless time to describe the sequence of the space of flows. Timeless time occurs when the characteristics of a given context, namely, the informational paradigm and the network society, induce systematic perturbation in the sequential order of phenomena performed in that context. The placeless time refers to the dissolving of geographical distance in the space of the flows, as organizational logic is placeless, it is fundamentally dependent upon understanding the space of flows that characterizes information networks and resultant literacy.

The epoch of Schizo Literacy

<21> However, we may legitimately ask the question, do we want our identities and consequent literacy to be washed away by this timeless space of flows? It could be said that the time of the internet defines a set of entanglement strategies for post-modern literacy education. This means that it gives the agents in the system the chance to scramble the codes that would wash away their identities. Castells (1997), however, addresses this question through an analysis of the self in network society, and the sites of resistance to the omnipotence of global network capitalism (and its corporation models). He identifies the "condition of structural schizophrenia" as characterizing the work of the space of the flows, as it impinges upon the self. He differentiates between three different types of identity when approaching the structure of schizophrenia. 1) Legitimizing identity: this is introduced by the dominant institutions of society to extend and rationalize their domination over social actors. Legitimizing identities generate civil societies in the sense of the original Gramscian concept of a set of apparatuses that were mirrored by Althusser's State Ideological Apparata (SIA). These reproduce what Max Weber called *rationale Herrschaft* (rational power). 2) Resistance identity: this is produced by those actors who are in a position/condition of being excluded by the logic of domination. Identity for resistance leads to the formation of communes and communities as a way of coping with otherwise unbearable conditions of oppression. 3) Project identity: these are proactive movements which aim at transforming society as a whole, rather than merely establishing the conditions for their own survival in opposition to the dominant actors. Feminism and environmentalism fall into this category (Castells 1997: 254). Castells theorized the weakening of the

influence of traditional legitimizing identities such as the nation state as they are under attack from the space of flows. Global monetary markets from the late 80s onwards have connected, and now form a structure that defies central organization from any one nation state (this is the undifferentiated plane of post-modern capitalism into which digital envelopment feeds). Castells put his hope in the rise of resistance identities and their links with the project activists, in order to fill the social hole left as civil society loses its legitimacy, and the structure of schizophrenia in the space of the flows threatens to knock stable identity out of the water. This paper places the communicative transformation and literacy of the net in this space, which doesn't preclude this type of Castellian linkage, and creates room for undirected subconscious literacy learning.

<22> Yet even these formulations seem to be tainted with schizophrenia. Perhaps it is better not to try to demarcate stable identities in the time of the internet at all, but to follow the aim of Deleuze and Guattari, and to draw escape routes from the prisons of the self through schizo-analysis. However we ask the question as to whether or not we wish our identities, literacy and values to be washed away in the flood of electronic circuitry, do any answers to these question hold any truth or singularity, given that the act of legitimization depends upon a reflexivity not possible in the channels of the flows? Students learning literacy on the internet will encounter and be able to take on various social, sexual, political, spiritual and intellectual identities; these are certainly not stable, but they are intricate, real and impossible to contain within a limited rendering of the human or the self. On a larger scale, the groupings that will arise out of this mediated exploration of internet literacy and identity depend strongly upon the cultural artifacts that they produce, and the material conditions that allow agents to get up from behind their monitors and socialize. The internet social formations include Star Trek societies, sexually liberated group meetings, self help psychology, ecological anti-capitalist anarchists, UFO and New Age religious units, ravers and right wing militias. The process of formation and literacy that is taking place within the space and time of the flows, is often located within the logic of corporate organization even though they are literally an anathema to it. This is the wholesale movement of culture and the entanglement processes that internet literacy seems to encourage; it is the mixing up of the codes on which society is based to reveal other possibilities. The linearity of the virtual majority, defines the intentionality of the most homogenous organizations (for example the Bush administration), whilst the time of the internet allows heterogeneity to emerge within the tenets of post-modern literacy learning about culture and consequently lifestyle choice – this is the epoch of schizo literacy.

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