

The Crisis in Media Art Education

by Trebor Scholz

There is a crisis mode in new-media art education. People who distrust this topic because it appears to be of little relevance to those outside of universities should think again. Education in media art is not limited to the campus and over the past ten years many thousands of students entered newly created media art programs that have been started at universities across the United States, Canada, Finland, Australia, Germany, the Netherlands and Switzerland. More recently, such initiatives gained momentum in Brazil, China, Thailand, Indonesia, Japan, Czech Republic, Slovenia, Russia, and South Africa. Christoph Spehr (media critic, Berlin) points out that "Teachers are dissatisfied, students are dissatisfied, the educational system is dissatisfied." ¹ But surprisingly, at least in the United States there has been no lively public debate about media art education so far. Some attention to it was given at single sessions at Dutch Electronic Art Festival (DEAF) in Amsterdam and Multimedia Art Asia Pacific International Conference 04 (MAAP) in Singapore and at Transmediale 05 in Berlin. This essay, while not addressing long distance education, focuses on 1) Struggles between cultural and technical agendas. 2) The new media theorist-practitioner. 3) Ecologies of knowledge and the networked commons. 4) Interdisciplinarity.

In front of our eyes new-media art curriculum is being shaped. The enthusiasm and energy caused by the relative newness of this area should be used now to re-consider which route emerging programs go before their curriculum gets fixed for years to come.

The often programmatic titles of programs in this area vary widely: "Media Studies," "Game Studies," "Media Ecology," "Interactive Telecommunications," "Software Art," "New Media," "Media Art," "Emerging Media," "Conceptual/Information Arts," "Arts, Computation, Engineering," and many others. The term "new media" itself is contested. Standing in for evolving technologies it is a changing signifier that does not point to one particular medium. The free online encyclopedia Wikipedia.org describes new media as usually referring to a group of media that are based on new information technology such as the internet and World Wide Web, video games and other interactive media.

A single ultimately evolved new-media art department cannot be found; one that would be able to truly implement all desirable qualities-- from rigorous, theoretical curriculum grounded in media history, to strong aesthetics based on critical concepts, technological sophistication, interdisciplinary exchanges and internationalization of the students. Equally there is no one-fits-all answer to the current crisis. Nevertheless, the "Share, Share Widely" conference about new-media art education that I organized in May 2005 along with many interviews and discussions that I facilitated leading up to it showed many striking similarities in positions while also outlining sharp differences. Tensions occur, for example, when ideas about new media education were formulated by authors who had little chance to test-drive them. The conference presentations and entries on the audio weblog supported the notion of a crisis mode. ² I will argue this throughout the essay.

Struggles between cultural and vocational agendas

The German explorer Alexander von Humboldt (1769-1859) centered his university program around science and education (Wissenschaft und Bildung). But the term science referred to the pursuit of knowledge for its own sake. Humboldt refers to "Education, [as not being] the pursuit of technical expertise or practical training, which equips one for worldly success, but [as] the preparation for a lifelong journey to selfhood."³ Harvard University developed its approach based on the British model and claims that "the aim of education was to train leaders for service in church, state, and society. The practical orientation was reinforced by a profound sense of pragmatism that runs deep in the American grain."⁴ Today, educators in media art programs disagree about the question of approach or aim for a combination of both, the German and the British/American model. A few examples:

Warren Sack (University of California Santa Cruz, USA):

"I think there are very specific "craft" skills that are relatively stable and that can be taught to students of digital media. For example, programming is a general skill that is essential to the construction of all digital media. Even if one does not know a particular programming language, if one knows how to program it is really not a big challenge to learn another language."⁵

Geert Lovink (University Amsterdam, The Netherlands):

"The Freudian question, "what does a company really want?" is the wrong one from the start. Problematic, off-track courses are much better for students. General skills last longer than the applications of the day. Schools that desperately try to comply with industry demands are often the least interesting ones."⁶

Siegfried Zielinski (Kunsthochschule für Medien Köln, Germany):

"For the theory and practice of art through media one does not inevitably have to be an engineer or programmer but it is very good to know how engineers and programmers think and work. Without respect for the work and method of others joint projects are not possible. The best media art projects are cooperative/joint."⁷

While Warren Sack and most of his American colleagues emphasize the importance of crafts training (i.e. programming), many Europeans opt for a model that follows Humboldt's notion of pursuit of knowledge for its own sake. Whichever of these positions we follow-- the focus should always be on educating artists, no matter which medium they use.

For students in the United States there is a lot of pressure (self-induced, from peers and family) that is based on the high cost of education, and the urgent need to get a job, which is reflected in demands for vocational training. It would be arrogant to dismiss these student requests. On the other hand, course selection needs to be more than shopping for career skills. In "The University in Ruins," Bill Readings points to a replacement of a culture of discourse with one of excellence. Readings argues that there is a widespread passivity in North American undergraduate students who have a sense of being "parked" at the university waiting to graduate instead of seeing themselves as heroes of the story of

their own education. ⁸ Geert Lovink: "Universities still consider the computer/new-media industries as somehow emulating a film-industry model, with a stable set of skills that each trained person goes out with into the world after graduation." ⁹ There is no monolithic industry which one could enter after graduation and therefore the kind of media literacies necessary for a productive professional future of students are hard to determine. Media departments at German academies purposely leave out graduate job prospects on their institutional websites. On the contrary, in the U.S. such professional futures are frequently listed, which does not always mean that these programs adequately prepare students for the stated profiles. To claim new media artist as one's professional goal is not useful in North America and also not very realistic in Europe (with the exception of some Nordic countries) as grants, and commissions will not add up to a living. In the worst case scenario a lack of critical vision leads departments to the 'safe bet' of vocational training. Students enter the university with Photoshop 5 in order to graduate with a later version of that same software. The cybertriumphalism that leads to "an exclusive emphasis on software programs is extremely problematic, as it leaves out the history of the tools that we are using, the politics of these very machines and the all permeating social context." says Amy Alexander, software and performance artist and faculty at University of California San Diego. Ana Marie Cox talks of the corporate desire for "just-in-time knowledge"-- that is, skills necessary for the job at hand, rather than basic, broader skills. As an example she cites Real Time Interactive Simulation, a higher-education institution licensed by the state of Washington and run by the Nintendo Corporation: "Students take no humanities or social science courses whatsoever. That's because those things are superfluous for the needs of the Nintendo Corporation." ¹⁰ Some educators in California described how the Disney corporation lured talented, skilled students before graduation with salaries that far exceeded their expectations at this point in their careers. Years later these technological workers were often not promoted, as they did not have a Masters degree. In this context the question of media-oriented departments versus theme-based groups is also relevant. Instead of grouping a department around a medium- smaller thematic groups would focus on broad issues and then find the most suitable medium to pursue their work. All this renders a struggle between vocational and cultural agendas.

For faculty, work in the rapidly changing field of computer-based media art requires frequent re-education. "This disparity in the demands made upon computer media faculty and their studio arts colleagues grows ever wider as the technology continues to evolve and is incorporated in more aspects of art and design curricula. [...] While it is desirable that over longer periods faculty produce and disseminate work, it should be expected that there will be some years in which faculty research is primarily in the form of developing new skills." ¹¹

New-media art education is of course not just limited to university students and faculty. There have been several tactical media projects with educational focus including the Autolabs in Sao Paulo. ¹² There are many independent networks and online research environments that provide free parallel projects, which offer learning situations that escape the rigidities and inadequacies of large institutions. The student uprising in Paris in 1968 led to general strike and occupation of universities and is part of the historical

trajectory of such projects. At the same time Fluxus artist George Maciunas argued for experimental educational laboratories and student-run seminars. The Freie Klasse (free class) as it is practiced in Berlin and Vienna made that a reality. Here, students organize courses in which they teach each other, shape their own curriculum, invite speakers and are also in charge of admitting new students. I will return to the topic of distributed learning networks later in this essay.

The New Media Theorist-Practitioner

"Theory without practice is empty; practice without theory is blind. The ongoing challenge is to bring theory and practice together in such a way that we can theorize our practices and practice our theories." ¹³ Educators from Europe, North America and Asia acknowledge a crisis mode also in their tough struggle for criticality, and content in the work of their students. This effort that does not always lead to satisfying results. With regard to their own work faculty who are theorists and artists struggle to get this entirety of their work acknowledged (e.g. by tenure committees who consist of tenured artists of a different generation). John Ippolito: "While art professors typically divide clearly into critical (Art History) and creative (Studio Art) faculties, new media's brief history often requires its practitioners to develop a critical context for their own creative work." ¹⁴ The creation of lively discourse around new media is a crucial contribution. Practice for today's practitioners in new media takes on the form of the production of texts, the production of art, and possibly also the production of events to encounter the scarcity of discourse about media art that is much bemoaned.

Kenneth Fields (Department of Digital Art and Design, Peking University of Software, Beijing, China) claims that there is no new media discourse in China, which is entirely focused on animation and sound design-- a night of substance (Kittler). This may not be entirely true in the face of recent international new media exhibitions and conferences that took place in China. ¹⁵ Often however, Elizabeth Goodman (San Francisco Art Institute) reports: "One of [the] greatest struggles during class [is] the fixation on the technical at the expense of the conceptual. One of the great challenges, I learned, of teaching "new media" classes that are not designed to be technical workshops is keeping promising concepts (that are often technologically interesting as well) from derailing into technological minutia." ¹⁶ Wolfgang Münch, media artist and faculty at LASALLE-SAI in Singapore asks: "Who introduces students to conceptual thinking? Who trains people in creativity? Can creativity be taught at all? In our courses at LASALLE-SAI we emphasize both critical thinking and technological skills. Many students have no real sense of what critical thinking means. In Asia the more common model is that students are listening, and then repeat back to the teacher... We need to help the students to unlearn, to try and open up to collaboration, for example. All these efforts aim at making students more competitive. The main educational challenge in Singapore is to show students that there can be value in a project without immediate commercial outcome." ¹⁷ How do we bring readings, art, and code awareness together? Who is willing to pay for playful, and experimental courses that do not rule out a chance for failure? Between Futurist narratives of techno-optimistic progress and the technophobia often encountered in more traditional narratives the social context in which much of the technological work is situated easily gets lost. Because of the pressure of learning programming languages or

the software packages of the day there is frequently simply no time left to emphasize critical concepts.

The current crisis is also signified by a lack of historical perspective. Elizabeth Goodman believes that "There is a tendency among the techno-obsessed to think that 'new media' is somehow the product of a catastrophic, unbridgeable break with older tools and practices."¹⁸ But media art cannot be taught without acknowledging the emerging field of media archeology, media history, the history of machine culture and art history. Media archeology opposes the idea that only the newest of the new matters. Excavating forgotten media of the past also reveals that the current media culture is a combination of new discourses and practices with those, which already emerged in earlier cultural contexts. Media history will be highlighted at an upcoming conference at the Banff Centre in Canada.¹⁹ In educational environments the mixture of past with emerging media is often missing. For example, contemporary media educators present their pedagogical approaches (i.e. assignments) as if they had no precedence in film, design, video, or performance curriculum.

In this context the question of theory comes up: What should our students really read? Only very few available texts address race and diversity in relation to media art. There is no widespread agreement on core curriculum and many educators use the few available anthologies of media theory, which are criticized by some as being Euro/US-centric. Students should learn that the conquistadors of new media art do not only produce in New York, Berlin and London, but also in Delhi, Seoul, and Sao Paolo. The fact that the benches of new media classrooms are still mainly filled with white male students does not improve this picture. Teaching resources in this area are sparse-- apart from Lisa Nakamura's book "Race in Cyberspace" and Wendy Hui Kyong Chun's "Control and Freedom" there is the online archive of the mailing list <nettime>. The curator Erika Dalya Muhammad organized the conference and exhibition "Race in Digital Space" and the Sarai Readers published in Delhi (India) are available for download as well.²⁰ In addition, if only loosely related is the catalogue of the "The Global Conceptualism" exhibition at the Queens Museum of Art.²¹ But at any account these are insufficient resources. International student exchanges are important to open students up but are not always possible due to administrative hurdles. Networked events or even just critiques between like-minded departments using web cams are another way to connect.

On an international level, new media theory, mostly written and published in the United States or Western Europe oftentimes does not speak to pertinent issues in Asia, Australia, or Eastern Europe. In absence of more situated media theory educators teach American or European texts. Wolfgang Munch states that "For the most part Western media critics speak to a Western situation."²² In response to this problem, the Australian research network Fibreculture satisfies the need for situated conversations about the way the media impacts Australians. Fibreculture's mailing list of 900 members (and growing) and its diligently publishing journal contribute to Australian media theory.²³ In Slovenia Marina Grzanic edited "The Future of Computer Arts," which includes several texts that reference Eastern Europe.²⁴

Apart from issues of cultural colonialism and geographically situated knowledge there is also the problem of translation. Contemporary German media theory, to state just one example, is virtually unknown in France and also the United States. While media theory written in Germany occupies radically different topical landscapes, there are only very few translations. This holds also true for Brazilian writing on open source software, for example. While free online translation services such as "Google Translate" or "Bablefish" have improved-- they are still more auto-poetic systems than workable translation tools.

Ecologies of knowledge and the networked commons

Globally there is a move toward increasingly collaborative modes of working and playing. The internet and much of social software facilitates this computer-mediated cooperative mode that also allows for the collective creation of knowledge. In the digital networked commons users and producers share, re-use, and edit each other's content. Historically, in England and Wales the commons was a piece of land that all could use (e.g. to graze their cattle upon it). In reference to the World Wide Web the term is used to describe areas that are not "fenced in" by corporate interest. Here, users can inscribe themselves into the collective process. They can participate in this global communication apparatus, this bazaar of ideas, the gift economy of the public domain. Since the early 1990s much discourse about the internet takes place in books but most of it is distributed via the World Wide Web. Axel Bruns (Media & Communication Discipline at the Creative Industries Faculty, Queensland University of Technology, Brisbane, Australia) comments:

"Broadly, I see two competing approaches at this point, which map very well onto the difference between closed and open source approaches: The 'locked-down institutional approach' is characterized by this motto: hang on to everything, keep it close to your chest until it is finally ready to be exposed to a wider audience. And then there is the 'commons approach' with its motto: share, share widely, in the belief that this approach will attract the best contributors and collaborators to the project." ²⁵

Students already participate in the networked lifestyle. They make use of social software (weblogs, networked games, and wikis) and networks already outside of the classroom. To introduce blogs into education is a logical step and is widely referred to as edblogging. A weblog, often shortened to blog, is a web-based publication consisting mainly of periodic articles. And a wiki is a web application that allows users to add content and edit everyone's content. Social software is the overarching term for systems that let people rendezvous, connect or collaborate by use of a computer network. Armin Medosch (media critic, London) formulates the ability of the Internet to connect people as its most crucial feature. He argues: "Besides access to information and cultural content, the most important property of the Internet is its capacity for promoting the creation of social communities since the properties of the medium both facilitate and actively favour the formation of groups." ²⁶

The intensity of networked/distributed learning in between people who are experts in different areas should not be underestimated. But the empowerment of students for the global knowledge commons (the sum of all publicly accessible material online) is an important issue in media art education. "Google Intellectuals" who have the skills to make use of online resources such as Google, Wikipedia or SourceForge have an advantage. Pit Schultz comments that "The more intellectual property is collectified, the

more sources are open, the more a critical mass of free knowledge becomes possible." ²⁷ I agree but would add that there many companies already working day and night to find a way of making commercial use of centralized, user contributed pools of knowledge. At the same time, this development questions the university. "The organizational structure and governance procedures of colleges and universities make it almost impossible for them to operate effectively in a world moving at warp speed. To prosper in network culture, it is necessary to make decisions expeditiously and to develop programs quickly and efficiently. [...] Curriculum will look more like a constantly morphing hypertext than a fixed linear sequence of prepackaged courses." ²⁸ Many universities have recognized the importance of the use of weblogs and wikis for research and discussion. Axel Bruns: "In the university blogging is great especially for first year students who find themselves in the middle of a new environment. Blogs allow them to share reflective journals, and throughout their academic careers these blogs are useful as they help students to self-monitor their academic development. Additionally, people can share their information and experiences, and collaboratively develop content." ²⁹

But at the same time educators struggle with erratic student participation in such networked environments. Opening a room, an online space, does not mean that people will come to party, to populate it with their texts and comments. What triggers participation? What does the browsing public really want? What makes people contribute to the public? Which groove makes people tap their feet? In "Behavior in Public Places" Erving Goffman describes how mutual openness is needed as much as a situation of informality and solidarity between individuals in order for them to contribute to a project. Individuals who can recognize each other as being of the same special group are more likely to communicate with each other. ³⁰ Furthermore, a steady increase in workload since the 1960s, privacy concerns, a certain "cyberbalkanization" and the amply-discussed lack of time for reflection due to information overload may be reasons for the resistance of students to use social software in the university. Can you think while doing? How much time do you spend deleting your emails and filtering what is relevant? By "cyberbalkanization" I refer to the much-noted ability of social software to serve as filter in a way that only connects one to those who follow one's special interests-- the like-minded. While daily interactions in the mall or grocery force us to deal with diversity--this distributed personalization of interest allows us to connect only to those who do not disturb our vision. From small professional groups, to self-help groups, and groups of bird-watchers there is much growth of connectedness and social interaction though these online fora. While such groups are experienced as strong support and possibility of exchange with others who may be very knowledgeable in the same field of research-- in an educational context it faces the danger that students perceive anything not immediately related to them as irrelevant. In his courses Alexander Halavais, 'blogologist' and scholar at the State University of New York at Buffalo, experienced about one third of his students getting actively involved in blogging, using it also after the course has ended. Another third would commit to and enjoy blogging for the course period only. The remaining part of the class would resist any blogging assignment. ³¹ Networked environments are not everyone. University of Toronto professor Barry Wellman found that "although the internet helps scholars to maintain ties over great distances, physical proximity still matters. Those scholars who see each other often or work nearer to each

other email each other more often. Frequent contact on the internet is a complement to frequent face-to-face contact, not a substitute for it." ³² In a similar line of argument Lisa Gye (Swinburne University of Technology, Victoria, Australia) argues that systems like Blackboard are dangerous because they reinforce the idea in students that they can enter the discursive space of the lecture by downloading a transcript of a presentation. ³³

Closely related is the topic of open content initiatives and open publishing. According to Wikipedia.org the term "open content" was coined by analogy with "open source," and describes any kind of creative work including articles, pictures, audio, and video that is published in a format that explicitly allows the copying of the information. Content can be either in the public domain or under a license like the GNU Free Documentation License, the Creative Commons Licenses. The ability to creatively improve, edit, and mix content is often limited by intellectual property laws. Lawrence Lessig with his books "The Future of Ideas" and "Free Culture" brought these topics to the forefront of public discussion.

In response to the high demands on educators in new-media art education in which technology and theory have few precedents and change rapidly-- several open content initiatives and distributed learning tools were developed to link up educators to share code, syllabi, theory, and references to artworks in real time. There are, for example, Rice University's Connexions Project, Harvard's H2O, and the Institute for Distributed Creativity's/SUNY Buffalo's Distributed Learning Project. While such initiatives create centralized and open (participatory) knowledge pools, they also serve as contexts for peer review and recognition outside of the classical format of the hyper-specialized academic journal. The economies of publishing output relate to the issue of tenure in academia. Before I address the importance of open publishing, I would like to briefly argue for the need for tenure in the United States. Tenure commonly refers to academic tenure systems, in which professors at the university level are granted the right not to be fired after an initial probationary period of 2-6 years. There are many valid arguments against tenure, which I will not address here and I am also aware that there may not be widespread sympathy for university professors (at least in American culture). But within the cultural and political context of today's United States, tenure is crucial as it protects faculty who speak out as public intellectuals (think Edward Said). Megan Boler (media scholar, educator and activist at the University of Toronto) points to a recent "CNN article that shows that a majority of young people in the United States feel that the first amendment goes too far in its assurance of rights. Data like this simply confirm that those of us who have the privilege to teach in colleges and universities must gather even more courage in what and how we are teaching. It is incumbent upon those who have tenure and job security to introduce the most unpopular ideas, to engage critical thinking in the best ways we can understand this, and to encourage active participation that engages new media." ³⁵ The case of my colleague Steve Kurtz needs mentioning here as well. Without tenure his job would have been at risk. ³⁶ In addition, faculty positions would be likely to disappear altogether in the ongoing efforts of the current Bush administration to cut spending on education. It is not the purpose of this essay to enter into this debate further.

Open access publishing/open content initiatives are discouraged under the current tenure evaluation models. Open publishing is a process of creating content, in which users can contribute a text and see it instantly appear online where it is publicly available. Publishing in open access online journals does not "count" towards tenure while closed access magazines are valued. This barbwire mentality is transferred to teaching when professors password protect their syllabi or keep their teaching materials close to their chest. Jon Ippolito (University of Maine) thinks that "Tenure, like copyright, has lost sight of its original purpose. There is a parallel between the problem that the university has in adapting to the digital world and the problems that copyright has in adapting to that same world. In both cases an initially very helpful idea has been corrupted into a paradigm of scarcity that keeps knowledge products in a small circle of a particular subculture. Currently, the tenure review process does not account for collaborations, as you point out. Knowledge is increasingly locked away, attached to money. In the case of tenure the gold standard is contributing to academic journals, each of which may cost a university \$ 10,000 annually in subscription fees. This makes a sizable number of subscriptions to such magazines only possible for the Harvard's and MIT's, and often leaves professors at other schools unable to assign students their own texts because their library cannot afford them."³⁷

When publishing on a new media mailing list an author can reach 3-5000 experts in the field while a book of a university press often circulates only years after it was written and runs as edition of 3000 copies with prices being up to \$70. This locks away knowledge rather than making it available to those who paid their tax money for its creation. At the "Share, Share Widely" conference McKenzie Wark referred to a recent conference on new media criticism at which presenters debated what they would do with the papers that they had written for this event. Wark suggested to put them online, which was opposed by a colleague who said that he insisted on a refereed journal instead as only that would count toward tenure.

Interdisciplinary Arts and Science Collaborations

The crisis in new-media art education is also evident in the trendy practice of interdisciplinarity in between the arts and sciences. The French sociologist Bruno Latour argues that scientific studies are socially constructed based on belief systems, and practices specific to the culture and tradition of science. Approaching collaborations from the social rather than the hard sciences could be an interesting starting point for artists. While interdisciplinary projects between the arts and sciences are emerging in ever growing numbers they only work rarely. We notice a subordination of the arts to the sciences in this trendy area. To truly collaborate, to work together, would mean that all participants bring an interest in a common goal to the process. In art-sci collaborations the artist all too often serves merely as illustrator who aestheticizes science and thus at best communicates the findings of the scientist to a public. In a functioning collaboration much time would be needed to develop trust and to learn about each person's (professional) needs and desires to be able to identify a shared goal. The artist's concerns and the interests of the scientist would need to have equal weight in such project. Within the busy lives of scientists (and artists) there is often simply not enough time (priority) given to such collaborative projects. Disciplinary condescension, incompatible

professional languages and cultures, as much as the often different political stands of artists and engineers, for example, all too often overshadow interdisciplinarity. How much of a discipline does the practitioner need to know in order to effectively speak to it? Artists encounter much disciplinary conceit with particular disciplinarians thinking that their discipline is primary, the core discipline to which others are welcome to contribute. Apart from this tension there is the business logic of the university with its trend to move the largest part of academic funding to the sciences. Universities see this investment as seed funding to attract corporate grants aiming for large-scale profits. In this battle over resources the humanities have no chance of winning and the funding for these areas of inquiry may increasingly be found only at Ivy League institutions who can still afford the luxury. In the context of this funding dynamic a widespread scientification of the arts can be noticed, which in the battle over grants adapts to science formats. This is not always a natural choice for artists. Their work is suddenly framed as 'research' and 'case studies' are being carried out. A Ph.D. is often necessary to apply for national science grants and the noticeable interest in practice-based Ph.D.s may be related to this funding logic. Organized research networks such as the Institute for Distributed Creativity (iDC) can support collaborative efforts in this area. The iDC offers a program, as part of which artists can apply for grants in the amount of \$1-5, which then make it easier for artists to find other funding.

How can "new media education" get ready for the morning after when analogue, digital and networked media will be parallel, even-leveled choices for young artists? This essay points to several issues in media art education that programs need to work through to still be able offer a sound education to students once the newness of such programs has worn off.

Notes:

1 While Spehr's notion of free cooperation does not address new media education as a central focus, this conversation outlines Spehr's thoughts on education in a broader perspective. Scholz, T. (2005) Christoph Spehr: Education and Crisis, Transcript from WebCamTalk 1.0 [Internet], Available from: <<http://mailman.thing.net/pipermail/idc/2005-January/000020.html>> [accessed 10 July 2005].

2 Scholz, T. (2005) Website of Conference "Share, Share Widely" On New-Media Art Education [Internet], Available from: <<http://newmediaeducation.org>> [accessed 10 July 2005].

3 Taylor, M. (2001) The Moment of Complexity. Emerging Network Culture, London, The University of Chicago Press, p.246.

4 Taylor, M. (2001) The Moment of Complexity. Emerging Network Culture. London, The University of Chicago Press, p.247.

5 The complete quote by Warren Sack: “On the one hand I disagree: I think there are very specific "craft" skills that are relatively stable and that can be taught to students of digital media. For example, programming is a general skill that is essential to the construction of all digital media. Even if one does not know a particular programming language, if one knows how to program it is really not a big challenge to learn another language. On the other hand, I agree: there is no one industry for which students are being prepared.” Scholz, T. (2005) Interview with Warren Sack on New-Media Art Education by Trebor Scholz, Transcript from WebCamTalk 1.0 [Internet], Available from: <<http://mailman.thing.net/pipermail/idc/2005-January/000017.html>> [accessed 10 July 2005].

6 Lovink, G. (2003) The Battle over New-Media Art Education. In: My First Recession: Critical Internet Culture in Transition. Rotterdam, V2_Publishing/NAi Publishers. p.172.

7 Zielinski, S. (2004) Manifest 2003. In: Broeckman, A., Frieling, R. eds. Bandbreite. Berlin, Kulturverlag Kadmos, pp.109-110. Translated from German by Trebor Scholz.

8 See the book Readings, B. (1997) The University in Ruins. Cambridge, Harvard University Press.

9 While not yet available online this essay by Geert Lovink addresses many of the key issues in new media education. Lovink, G. (2003) The Battle over New-Media Art Education. In: My First Recession: Critical Internet Culture in Transition. Rotterdam, V2_Publishing/NAi Publishers, p.173.

10 Cox, A.M. (2003) None of Your Business: The Rise of the University of Phoenix and For-Profit Education -- and Why It Will Fail Us All. In: Johnson, B., Kavanagh, P., Mattson, K. eds. Steal This University. London, Routledge, pp.15-32.

11 While these CAA guideline were written in 1995, they still have not reached all new media departments. College Art Association. (1995) Guidelines for Faculty Teaching in Computer-Based Media in Fine Art and Design [Internet], Available from: <<http://www.collegeart.org/caa/ethics/teaching.html>> [accessed 11 July 2005].

12 To read more about the Autolabs go to Garcia, D. (2004) David Garcia, Fine Young Cannibals, of Brazilian Tactical Media [Internet], Available from: <<http://mail.kein.org/pipermail/incom-l/2004-September/000114.html>> [accessed 10 July 2005].

13 Taylor, M. (2001) The Moment of Complexity. Emerging Network Culture. London, The University of Chicago Press, p.233.

14 To get a more in-depth introduction to the issues of standards of recognition in new media research you can read and contribute to-- Blair, J., Ippolito, J. (2005) Standards of Recognition [Internet],

Available from:

<http://cordova.asap.um.maine.edu/wiki/index.php/Standards_of_Recognition> [accessed 10 July 2005].

15 Listen: Fields, K. (2005) Audio blog entry by Kenneth Fields as part of "Share, Share Widely" conference [Internet Sound Recording], Available from:

<<http://newmediaeducation.org>> [accessed 10 July 2005].

While Fields observation of a poverty of discourse in new-media art in China is correct, several recent new media conferences in Beijing have to be noted. The Second International New Media Arts exhibition and conference "In the Line of Flight" took place in June 2005 and was organized by Zhang Ga with institutional partners such as ZKM, V2, and Banff New Media Institute. Available from: <<http://newmedia.beijing.org>> [accessed 10 July 2005]. It was reported that entrance fees for some of such events were prohibitively high for students, for example.

16 Scholz, T. (2005) Teaching for the Wireless Commons. An Interview with Elizabeth Goodman as part of WebcamTalk 1.0 [Internet],

Available from:

<http://distributedcreativity.typepad.com/idc/2005/02/teaching_for_th.html> [accessed 10 July 2005].

17 Scholz, T. (2005) New Media Education in Singapore. An Interview with Wolfgang Muench as part of WebcamTalk 1.0 [Internet],

Available from: <<http://mailman.thing.net/pipermail/idc/2005-April/000040.html>>

[accessed 10 July 2005].

18 Scholz, T. (2005) Teaching for the Wireless Commons. An Interview with Elizabeth Goodman as part of WebcamTalk 1.0 [Internet],

Available from:

<http://distributedcreativity.typepad.com/idc/2005/02/teaching_for_th.html> [accessed 10 July 2005].

19 Diamond, S. (2005) Refresh. First International Conference on the Histories of Media Art, Science, and Technology [Internet],

Available from: <<http://www.mediaarthistory.org>> [accessed 10 July 2005].

20 Sarai (2005) Bare Acts. [Internet],

Available from: <<http://www.sarai.net/journal/reader5.html>> [accessed 10 July 2005].

21 Frieling, R., Daniels, Dieter. (2004) Global Conceptualism: Points of Origin, 1950-1980s. New York, Queens Museum of Art.

22 Scholz, T. (2005) New Media Education in Singapore. An Interview with Wolfgang Münch as part of WebcamTalk 1.0 [Internet], Available from: <<http://mailman.thing.net/pipermail/idc/2005-April/000040.html>> [accessed 10 July 2005].

23 Fibreculture (2005) Fibreculture. [Internet], Available from: <<http://fibreculture.org>> [accessed 10 July 2005].

24 Grzanic, M. ed. (2004) The Future of Computer Arts. Ljubljana, MASKA.

25 Scholz, T. (2005) Share, Share Widely. An Interview with Axel Bruns [Internet], Available from: <<http://www.pixelache.ac/2005/archives/share-share-widely-technologies-for-distributed-creativity/>> [accessed 10 July 2005].

26 Medosch, A. (2004). Society in Ad-Hoc Mode: Decentralised, Self-Organized, Mobile. In: Cox, G., Krysa, J., Lewin, A. eds. DATA browser 01. Economising Culture. On 'The (Digital) Culture Industry'. New York, Autonomedia, p.144.

27 Schultz, P. (2004). The Producer As Power User. In: Cox, G., Krysa, J., Lewin, A. eds. DATA browser 02. Engineering Culture. On 'The (Digital) Culture Industry'. New York, Autonomedia, p.119.

28 Taylor, M. (2001) The Moment of Complexity. Emerging Network Culture. London, The University of Chicago Press, p.234.

29 Scholz, T. (2005) Share, Share Widely. An Interview with Axel Bruns [Internet], Available from: <<http://www.pixelache.ac/2005/archives/share-share-widely-technologies-for-distributed-creativity/>> [accessed 10 July 2005].

30 Goffman, E. (1963) Behavior in Public Places. Notes on Social Organization of Gatherings. New York, Free Press.

31 Halavais, A. (2005) Audio blog entry by Alexander Halavais as part of "Share, Share Widely" conference [Internet Sound Recording], Available from: <<http://newmediaeducation.org>> [accessed 10 July 2005].

32 Putnam, R.D. (1999) Bowling Alone. New York, Simon & Schuster. p.179.

33 Scholz, T. (2005) On Situated Media Criticism, Personalized Education and the Organized Network Model. An Interview with Lisa Gye [Internet], Available from: <<http://mailman.thing.net/pipermail/idc/2005-April/000043.html>> [accessed 10 July 2005].

34 Taylor, M. (2001) The Moment of Complexity. Emerging Network Culture. London, The University of Chicago Press, p.250.

35 Scholz, T. (2005) Politics and New Media Education. An Interview with Megan Boler [Internet],
Available from: <<http://mailman.thing.net/pipermail/idc/2005-February/000023.html>> [accessed 10 July 2005].

36 Critical Art Ensemble (2004) Critical Art Ensemble Defense Fund. [Internet],
Available from: <<http://www.caedefensefund.org/faq.html>> [accessed 10 July 2005].

37 Blair, J., Ippolito, J. (2005) Standards of Recognition [Internet],
Available from:
<http://cordova.asap.um.maine.edu/wiki/index.php/Standards_of_Recognition>
[accessed 10 July 2005].

References:

Kittler, F. (1989) Die Nacht der Substanz. In: Engell, L., Fahle, O., Neitzel, B., Vogl, J., Pias, C. eds. Kursbuch Medienkultur. Stuttgart, Deutsche Verlags-Anstalt GmbH, pp.507-524.

Said, E. (1994) Representations of the Intellectual. New York: Vintage.

Lessig, L. (2001) The Future of Ideas. New York: Vintage.

Lessig, L. (2001) Free Culture. New York: The Penguin Press.