

ART/SCIENCE and EDUCATION

we have to know what we want to know before we can start looking for it

Introduction

There has been an ongoing discussion for several years now on the relationship of art and science in educational and professional contexts. Is this just another attempt to put an old fashion into new clothes? I do not think so, because this time the arguments do not constitute an attempt to make a qualitative distinction between universities or higher institutions of art, design and media. Nor is there a fundamental dispute involved whether the artistic singularity of an artefact or scientific objectivity claims to have more epistemic value.

In search of significant sources nourishing the current discourse, paradigmatic changes in the process of renewing and preserving the conditions of cultural self-organization are key to a major shift in how we construct knowledge, technology and cultural memory. It concerns institutional forms as well as the individual.

One of the standpoints is to consider a revival of the „Leonardo principle“. A second standpoint might close the chapter of the relationship between art and science for the benefit of scientific-economic prosperity, whereas a third engages with the question of how cultural, intellectual and spiritual fields are prerequisite to evolutions in art, science and technology. My affinity is with the third one, although some of the issues relating to this area are similar to other positions.

Many questions derive from the context of audiovisual restructuring of knowledge and communication areas in interrelated and cooperative fields moulding into novel forms of interdisciplinary design, such as BANG design, whose acronym stands for the basic modules of our world (B=Bits, A=Atoms, N=Neurons, G=Genes).¹ This field will be extended by neurophysiological research into cognition and perception, not to be confused with the ontological and philosophical terminology of cognition and perception. In conjunction with media- and biotechnological industrialization of codes, concepts and design in the educational context of art and science have been renewed.

Can both art and science learn from each other, and, if so, at what and for what? Do both act in the same framework of design and conceptualization, as some of the new generation of media artists suggest in their explorative approach? Would it make sense to exchange curricular modules between specific study programmes?

Narrowing down the thematic frame, one crucial question remains: Which of the teaching and learning fields between art (in terms of audiovisual media design and media use) and science (in terms of research of audiovisual cognition, development of formalized models containing complex mediality and prototyping of media structures) can be formulated? The paradigmatic closeness of art, science, the economy and politics might suggest a consistent media evolution based on media convergence, yet this does not give us a satisfying answer.

The point is if, and if so, to what extent does it become meaningful to reformulate the very densely organized media evolutionary areas to make plausible and distinct the differences between artistic and scientific education. In that respect it will not make sense

¹ Bolz, Norbert (2006): bang design – design manifesto of the 21st century. Hamburg: Trendbüro

to reactivate old habits to distinguish between art and sciences. Current developments in media and biotechnology, neuroscience and cognition research, but also in humanity and cultural science, demonstrate the interrelatedness of knowledge creation and knowledge representation. These developments cope with the complexity of design and research thus being of a transferable structure. This principle similarly applies to art and science.

In fact, novel theoretical delineations of model, game and communication knowledge in different contexts has changed the theoretical architecture if we consider the impact of second-order cybernetic and radical constructivism (von Foerster), positions in Endophysics (Rössler),² concepts of neuronal networks and *fuzzy logic* and *boundary management* concepts mediating between disciplines and product developments. However, these radical changes in cognition and design architecture have had less impact on learning and knowledge organization thus far. A conceptual lag can be identified in both teachings and research.

We know, for example, that not only knowledge and media technology is changing rapidly, but learning attitudes and styles are also changing fluidly across different technologies, interfaces and modes of interaction. As a consequence institutions react with a stronger emphasis on project and praxis orientation. It is not so much about how specific themes relate to a subject or university-specific didactics. The crucial issue concerns the way and to what extent the changing organization of perception and cognition, designing, processing and selection is teachable, and if it is teachable, how it can be conducted.

“Education” – one of three leitmotifs of documenta 12

If we accept one of the prevailing concepts in 20th century theory, art would predominantly be created by its viewer and users; based on the economy of attentiveness and the market, a serious discussion on curricular changes would be useless. In other words art cannot be taught if it is to “potential” art producers. Would education then solely be a privilege for curators, patrons, visitors of museums and galleries, cultural managers who create, reflect and provide affirmative market behaviour? Obviously there is still a dichotomy between institutional education and self-education.

In his introduction on “Education”, one of the three leitmotifs of the forthcoming documenta, Roger M. Buergel’s statement “What is to be done” appears rather apodictic.³ Buergel stresses the importance of self-education through research and analysis that should be part of discursive practice.

The global complex of cultural translation that seems to be somehow embedded in art and its mediation sets the stage for a potentially all-inclusive public debate. Today, education seems to offer one viable alternative to the devil (didacticism, academia) and the deep blue sea (commodity fetishism). (Ibid., p. 1)

Rather than specializing and emphasizing the boundaries between discrete areas of thought, Buergel wants to erase these boundaries. He thinks that the system of higher education in Europe is more or less bankrupt since the Bologna Process (promoting a

² Interview with Otto E. Rössler (in German): Vom Chaos, der Virtuellen Realität und der Endophysik. <http://www.heise.de/tp/r4/artikel/5/5004/1.html> (15.11.2006).

³ Documenta 12 – leitmotifs, <http://www.documenta.de/english/leitmotifs.html> (06.11.2006)

common European area of higher education)⁴ governs people too strongly. In this respect Buergel excoriates the instrumental approach to education predicated on market economics. His critique points to commercialization tendencies in education based on commercialized access to high-quality information. The individual will no longer be the knowledge owner; rather it will be the enterprise in which he/she is employed.⁵ In sharp contrast to the changing higher education policy in Europe, which is drifting away from free access (tuition fees have recently been introduced in several European countries) and fundamental research into applied research that would blur and eradicate academic tradition and institutional uniqueness, Buergel stresses the need for autonomous education and development of one's personality. The educational concept with which he operates has a bold notion of an all-encompassing education, a concept which goes back to Wilhelm von Humboldt, that drastically differs from instruction and knowledge transfer.

The educational concept Buergel suggests, however, conveys a rather simplified antagonism between idealism and commodification, between a politically responsible and seemingly non-responsible audience, and between low and high culture.

Opinions differ on education: the ethos of education reveals the difference between an attitude of mere consumption and an emancipatory ambition. Here is where the exhibition differs from Disneyland, from a seminar at the university, from a discotheque, from the Louis Vuitton shop. Or not.⁶

In fact, the educational landscape and discourse relating to art has long since evolved to cover a much wider range of important issues to be explored such as media and popular culture. „Takeover – who is doing the art of tomorrow“, the topics of *Ars Electronica* 2001,⁷ strove for a much broader discussion on new manifestations of art and fluid learning arrangements driven by the dynamics of digital revolution. I do not agree with Buergel's postulate on such an idealistic approach of self-education, because the dynamism of „Takeover“ does not originate from traditional art practice and mediation, but rather from largely heterogeneous, rhizome-like structures and networks of remotely connected individuals and online communities. The common goal of these activities pertaining to evolving culture are not merely a distant-reflective kind of reaction to techno-social changes; in fact, they constitute and develop further this genuine field.

Digital network culture has not only been changing the modes of media production and distribution: it coevally conveys emerging models of cooperation, communication and interaction by accumulating various ideas, talents and capabilities. Hence, the tasks of tomorrow's artist is that of an intermediary, a catalyst between diverse fields of knowledge, ways of thinking, social models and solution strategies. The protagonists of this development, hackers, software artists, media and knowledge designers who are irrespectively showing strong commitment in the face of considerable risk, are opening

⁴ Education ministers from around 30 European countries had met in Bologna and undertaken in a joint declaration (the Bologna Declaration) to establish a European area of higher education by 2010. http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html (16.11.2006)

⁵ Buergel, Roger M.: Correspondences. In: Circa Art Magazine. http://www.recirca.com/backissues/c113/p43_48.shtml (18.11.2006)

⁶ cf. Buergel, Roger M.: http://www.documenta12.de/english/news_a20.html (18.11.2006)

⁷ Stocker, G./ Schöpf, C. (ed.) 2001: *Ars Electronica 2001*. Wien, New York: Springer.

up new territories in which their role and their scope of action have not yet been fully explored. This alludes to critical inquiry, research and development in sociopolitical and scientific (biotechnology and genetic engineering) contexts.

Interestingly yet not surprisingly, the conventional artistic discourse has been cultivating and maintaining a self-referential and affirmative practice among galleries, magazines, investors, dealers and critics. The corporate image of the artwork has long since replaced the artwork itself. A good example is the "Institutional Critique", an art practice in which often only advanced artists, theorists, historians, and critics can participate. Due to its highly sophisticated understanding of modern art and society, as part of a privileged discourse like that of any other specialized form of knowledge, it has predominantly yielded alienated and marginalized viewers. Net art in contrast has explored the field in a much broader context by exemplifying the work of art as a process, as opposed to a conception of art as object making. Since net art is "immaterial", commodity value is replaced by utility value: i.e., the principles of the net economy are based on an economy of scale where there is no scarcity of goods. Thus the added value is not generated by a thousand copies of the same "product" but instead by the "exchange value" that is based on each different source of information and not on each individual copy (cf. Ghosh 1998).⁸

In his lecture "Science as an Open Source Process", Friedrich Kittler⁹ argues that the liberty of science rises and falls in parallel with source code liberation. Only now will science become a university. In that sense, the definition of university implies, differently from in closed or secret research centres, that the knowledge must circulate and be accessible without the protection of patents and copyright issues. Media convergence gives us the opportunity to dissolve the media-technical boundaries between natural scientific, technical and cultural knowledge.

Transitory processes

In my reflection on transitory processes in art, science and education, I will refer to Roger Fidler's Mediamorphosis, which describes the material, logical and cultural practical use and developments of media. Art and science are dependent on these morphic surroundings by inventing, developing and generating new ones. Relating to this dimension of mediamorphic events, I would like to add the following quotation:

Cyberspace... enables its audience not merely to observe a reality, but to enter it and experience it as if it were real.... Whereas film is used to show a reality to an audience, cyberspace is used to give a virtual body, and a role, to everyone in the audience. Print and radio tell; stage and film show; cyberspace embodies.¹⁰

⁸ Ghosh, R. A.: „In an environment where it costs next to nothing to duplicate a product, exactly what is scarce? A Ferrari F40 would presumably be cheaper if it cost under a dollar to make a perfect copy.“ http://www.firstmonday.org/issues/issue3_3/ghosh/ (08.12.2006)

⁹ Kittler, F.: „Wissenschaft als Open-Source-Prozeß“, <http://www.mikro.org/Events/OS/ref-texte/kittler.html> (08.12.2006)

¹⁰ Walser, R: "Elements of a Cyberspace Playhouse" (1990), cited in Howard Rheingold, Virtual Reality (NY: Simon & Schuster, 1992), p. 192.

Questions arising in this specific context relate to teachable contiguity in media production and design, the ratio between subject and media specific teachings, and how both can be applied in a dynamic, reciprocal mode.

Media evolution has been taking place over many centuries as specialization and fragmentation of sensual perception, communication and concepts of truth. It has been a long history of segregation of multisensoric options in human self-organization. The effects of this process of specialization and disjuncture have generated particularly strong systems such as paintings, scripture, sciences, aesthetics and so on. This has led to a material and mental disparity to which can be assigned the same texture and facture and distinctive canonic differences as with institutions, iconoclastic and iconophilic cultures. Some of the distinctive systems that arose out of this process, such as the privileged status of reading over vision, have come under pressure by multimodal and multicodal forms of production, perception and reception. Alongside the media's evolutionary "agenda", post-modernist and post-structuralist concepts (Derrida, Foucault, Lévinas) and tendencies of individualization as for socio-cultural changes and use of the new media are frequently being conceptualized as a dichotomy of unleashing ("deboundarization"). However, in the current media discourse there are tendencies to discover media practice from another perspective, which means that a connection between persistence and recombination of social structuring and social practices can be seen as a model for social change. This model is based on the hypothesis that the use of new media is based on given social structures and social practices. With respect to tendencies like individualization and globalization, the social potential of new media such as weblogs¹¹ offers distinct forms of media use within different social practices, including the strengthening of the latter as well as doing without them.

With regard to media-related functions and their proliferation, the extension of computer technology is irreversibly encoded in delocalized media and electronic networks as part of culture and society as distributed and diversified systems. A constituent factor in this process is media convergence or integration. Alongside the media synthetic approach to merge different media into one, we can identify another important attempt towards multisensory perception. The visual sense, the faculty of vision, gets back its vast cultural spectrum ("from *Lascaux* to the *Virtual Museum*") and in parallel the interface changes into a multisensory one. This epoch-making electronic and fibre-optic based media convergence has ceased the history of media divergence. From now on, the point is how different media functions, whether in a *pure* or *crossover* mode, come into play.

Screenager, a term first coined by Douglas Rushkoff in his 1997 book *Playing the Future*, is a technologically savvy young person, living next door with audiovisual gadgets and interfaces, where he/she interacts in a mediated setting of learning, entertainment, peer bonding and play. Is the interconnected "mediaspace a co-operative dream, made up of the combined projections of everyone who takes part",¹² or do these trade-offs speak to a wider set of socio-cultural implications and consequences in light of an education "close to reality"?

Taking into account the next generation of students there is now a way to cope with hybrid digital learning cultures. What was with all those demands for change in higher

¹¹ See also Herring, S. C., Scheidt, L. A., Wright, E., and Bonus, S. (2005) Weblogs as a Bridging Genre. *Information, Technology, & People*, 18 (22), pp. 142-171.

¹² Rushkoff: 1999, p. 269.

education institutional settings? Although several educational outreach activities have been undertaken since then, the mediation paradigm (“blended/hybrid modes of teaching and learning“) often fails on the basics.

If we interpret art and science as two dimensions relating to (post)modernist and interface culture, the prerequisites in defining a new curriculum changes significantly. It would thus demand another structure of design capabilities corresponding with an all-encompassing model of knowledge design. Thus, many of the practices and alternative viewpoints these theories claim, as for adaptive, flexible and transgressive forms of learning and developing new contextual abilities, would likewise change artistic and scientific educational processes. The most fundamental macro-question in communication, media theory, and cultural theory is the nature of mediation, which means that we have always been in language, in symbolic systems, and we know our lived-in world by language, discourse, and signs, not by immediate access to “things in themselves“ (Kant). The primacy of mediation in any theoretical model is milieu, medium, structure and system of mediation. Hence artistic practice significantly changes into mediation between the viewer and the subject, between “art“ and “life“, media, technique and expression, art and institutions, copyright and art work...

Over the last two decades, we have learned to know about dissipative structures in biology, fractal and chaos theory, network and self-organization theory, yet with little impact on the academic institutional teaching and learning culture. With the notion of social technologies, the accompanying current transformation process from single authorship to co-authorship, public versus person-to-person communication, contributions versus display, has become virulent in the net activism of the 1990s that links in many ways with the social or socially critical processes of the 1960s and 70s (e.g. U. Eco’s “open“ works of art and J. Beuys’s concept of “social sculpture“ relating plastic creativity to socio-political activities, K. Galloway and S. Rabinowitz’s “Hole-In-Space“ as for telematics and telepresence). Current social software developments are merging the socio-political and media-technological towards a democratizing and participatory media approach.

By applying this to learning processes in a digital age, one of the main questions is how the increased recognition of interconnections in differing fields of knowledge, systems and ecology theories is perceived in light of learning tasks. Alternative theories deriving from chaos, self-organization and social network theories suggest that we can no longer personally experience and acquire the learning that we need to act. We derive our competence from forming connections. Chaos, as a science, recognizes the connection of everything to everything.¹³ The butterfly analogy highlights the challenge of how we deal with sensitive dependence on initial conditions that profoundly impact what we learn and how we act based on our learning. As for social-network theories, Albert-László Barabási states that “nodes always compete for connections because links represent survival in an interconnected world”.¹⁴ This competition is largely dulled within a personal learning network, but the placing of value on certain nodes over others is a reality. Connections between disparate ideas and fields can create new innovations. This amplification of

¹³ cf. Gleick’s “Butterfly Effect“. In: Gleick, J., (1987). *Chaos: The Making of a New Science*. New York, NY, Penguin Books.

¹⁴ Barabási, A. L., (2002): p. 106

learning, knowledge and understanding through the extension of a personal network is the epitome of a new learning culture.

Multiple perspectives

The creation of multiperspective perception does not necessarily require interdisciplinarity, which sometimes disguises academic disciplinary thinking. Moreover it should be a process of reorientation and aggregation of subject specific knowledge and coherences, yet under the premises of audiovisual introspection of our cultures through mediality. The reference system to which the process of knowledge creation adheres could be easily extended if we consider e.g. the traditional panel not only as a technique of representation but also from the viewpoint of techniques of (self) observance, which means the cooperative integration of acoustics and optics, mathematics and epistemology, neurophysiology and communication theory, media evolution and visual sciences, Gutenberg and Turing, Disney and Godard.

I think it is important to define (audio-) visual education no longer through either exposed or archived representativeness. There are neither economic arguments to make plausible a separation of text and image, generated and displayed in the same medium, nor other acceptable objections, whether they stem from platonic reasoning or similar epistemological coinage, to deny images the same intelligible and explanatory potential that has been ascribed to scripture and text over the centuries.

Computer-generated visibility applies to encoded data representations, which simultaneously show a typographic simulation and a visualization. The collapse of the classical semiotic reference system of “signification” (Pierce) has been superseded by the sober conclusion that “[i]mages do no more represent world but data“, or, as Peter Galison puts it, “Images scatter into data, data scatter into images.”¹⁵

GoogleEarth is a good example of how the cartography of the world increasingly flows into the cartography of the internet. "World" becomes downloadable, navigable and manipulable. Programming (technique), interface (aesthetic) and interactivity (human-machine, human-human interaction/social dimension) merge into new modes of production, perception and reception. Since human cognition strongly relies on visual patterns, the enormous amount of data demands new visualization strategies. Simulation is an attempt to model a real-life situation on a computer so that it can be studied to see how the system works.

Another important aspect relates to communicative skills and competences as dialogical principles. Changing perspectives also means the communicative interdependency between the respective knowledge and skills in relation to social praxis. If we acknowledge the fact that knowledge, competences and skills are circularly determined, long-term planned curricula would no longer work as for teaching in art or science. Courses of instruction claim to be flexible and adaptive, and as a consequence, new dependencies emerge between institutions, processes of accreditation and the actual course developments.

Another assumption pertains to the rhetorically well-trained relationship between ethics and aesthetics, or following Aristotle’s formulation, *phronesis* (mitigation) and *aesthesis* (sense perception). Perhaps one should avoid making the mistake to constantly serve the

¹⁵ c.f. Peter Galison, In: Latour, B. P. Weibel (2002): *Iconoclasm: Beyond the Image Wars in Science, Religion and Art*. p. 300, ZKM & MIT Press.

purpose of complementary fulfillment of both, e.g. media-technological **and** artistic skills, mediality and aesthetics. It would be a fatal backslide into premodern concepts of harmonic principles, which are in my point of view, from a media-theoretical standpoint, no longer applicable in contemporary contexts.

Complexity

An all-encompassing thought relating to my final considerations is that of complexity, meaning an uncountable dimension of non-predictable events.¹⁶ With regard to thinking critically and productively about media form, content, and context, it is difficult to say whether it will be ever possible to educate media competence that fulfils the demands of complexity. It seems to me that it is more appropriate to develop sensitivity in managing complex situations and demands. That is to say that neither artists nor scientists are able to predict if and how their ideas and concepts will be accepted, copied, evaluated and varied upon. Artists by their nature seem to be more dependent on the selecting milieu of appreciation than might be said of scientists. In my opinion, thinking and doing are rather isolated qualities in artistic areas that need to be strategically developed for the competitive art and gallery business. This empowers artists on the one hand to display a sensibility for complex demands “just in time”; on the other hand many promising artistic careers have failed to cope with those specific demands. Indeed, scientists have developed a certain kind of sensibility for complexity as well, but how they differ from artistic milieus is a peculiar attitude of prudence towards provenance, causation and precondition that strongly relates to thinking in systematic order and theoretical boundaries.

Both of these, current practices of sensibility for complexity in media arts and the sensibility for stringent reasoning in media, cognitive and communication sciences, could, if flexibly applied in learning processes, stimulate the co-designing of novel hybrid forms in theory and practice.

Practice

How can these expectations meet the challenges in learning and teaching contexts?

– *Modularization*: This is to increase the system's responsiveness to changing skill needs. Modules in audiovisual, media-technological, cognitive and communicative areas are easier to revise and update than full courses. The pedagogical changes implied are to encourage more student-centred, self-regulated, participative and active learning. Modules can be defined based on projects or tasks to encourage learning and to develop “transferable skills“ such as personal autonomy, responsibility, decision-making and the ability to exercise initiative. A modular structure is used to support independent study and individual student needs. This should be thought of and realized as a revocable, temporal-limited structure within adaptive learning processes.

¹⁶ “Complexity“ was an exciting new interdisciplinary area of inquiry that emerged in the 1980s (cf. M. Mitchell Waldrop, *Complexity, Touchstone*, 1992), in large part because computers made it possible for the first time to make observations on the behaviour of "iterative" systems.

– *Projects*: Project work emphasizes explorative learning and research-based design in knowledge building communities and organizations¹⁷ supported by socio-cognitive dynamics and technological dynamics. As for socio-cognitive dynamics, community knowledge and collective responsibility equally foster individual achievements and contributions to shared, top-level goals of the organization.

Democratizing knowledge means that diversity and divisional differences represented in any organization do not lead to separations along knowledge have/have-not or innovator/non-innovator lines. In order to achieve symmetry in knowledge advancement, expertise is distributed within and between communities. To give knowledge is to get knowledge. Early acquaintance with such technological, theoretical and communicative complexity advances thinking and acting in cooperative design processes.

– *Field Practice*: The dynamics of knowledge creation and distribution alongside the side-effects of neoliberal labour policy requires critical and creative thinking more than ever before. Internships in diverse scientific, economic, artistic, public and administrative working fields offer the possibility of learning and knowledge transfer in some of the professional areas with which teachers and learners are less familiar. In fact, new technologies require a much broader spectrum of competences, skills and knowledge such as social communicative competences, contextual abilities, flexibility and attendance to work and practice in collaborative environments, a disposition to challenge the ongoing paradigm shift in the knowledge society, an openness to socio-cultural diversity, a wide range of ICT skills through work or study, practical and theoretical skills in media and visual literacy. The need for such experts is not confined to any of the cultural segments.

Suggestive curricular topography

I would firstly like to suggest three interrelated fields to which an integrated audiovisual curriculum should establish a clear reference. Secondly, I will deal with a more precise depiction of several interrelated layers in teachings.

I. Areas of sensual, mental and reflexive media perception and usage that includes

- Visualization (image, text, text-image, three-dimensional, morphic etc.);
- Abstraction (scientific models, artistic modes of representation, virtual environments, abstract vis-à-vis such as avatars, e-agents, knowbots etc.);
- Imagination (poetic, literary, semiological, playful, fictional etc.);
- Operation (interaction, cooperation, synchronous communication, video-conferencing, collaborative work etc.);

II. Spatio-temporal perception, contextualization and reflexion in creative processes relating to

- Human-human interaction (face to face);
- Human-machine interaction (based on division of labour);

¹⁷ Knowledge Building terminology stems from Scardamella & Bereiter, Ontario Institute for Studies in Education.

- Human-medium interaction (from face to interface);
- Human-net-human interaction (endo-face);

III. Contextualization of present forms of knowledge and design containing

- Applied and systematic structures in scientific, technical and vocational education;
- Artistic knowledge areas;
- Knowledge models (heuristics, theoretical architectures, communication media);
- Prevalent artistic models from a historical perspective;
- Differentiation between production, communication and attendant media.

Finally, I would like to tackle some of the possible teaching and content layers, which I consider important in a variety of possible combinations. The following list suggests an open-ended and modifiable structure. You are invited to reshuffle, expand and to mingle new and existing areas of interest referring to an educational setting in scientific and artistic related media education.

Some of the knowledge areas are:

- Data and information technology;
- Digital media;
- Network technologies;
- Theories of perception from psychology, neurophysiology, brain research and radical constructivism;
- Prevalent communication theories;
- Media (art) history, media evolution, and media anthropology;
- History of optical media and acoustics, theories and concepts of image processing and production (computer-generated images and non-optical images);
- Colour theory and optics;
- Acoustics;
- Artistic, cultural, scientific spatial and temporal models;
- Cybernetics and second-order cybernetics, chaos, complexity theory;
- Media theory and media sciences;
- Cyberlaw;
- Network models and theories;
- History of aesthetic concepts of visibleness;
- Social research in usability and ergonomics.

It is obvious that the suggested list contains core areas where it is not yet defined how those areas of knowledge are purposefully mediated and how teachers establish pertinent ways of transfers relating to their competence and appropriate and media adequate means and methods for modularization and project work. Apparently existing dilemmas relating to inappropriateness in bridging digital culture and traditional academic teaching and mediation concepts cannot be resolved only by acknowledging the preconditions of the various possibilities conveyed by a media-technologically generated reality. Hence the challenges of curricular changes and re-orientation cannot be effectively implemented without respecting paradigmatic changes in non-formal and informal learning processes.

In search of an idea that could encompass all relevant thoughts, perhaps one can assume that the suggestions being made envisage stimulating a research-narrative and an explorative-narrative based learning approach.

However, there still remain differences between art and science:

It is possible to educate to design the artificial, but it will not be possible to educate artistic design, concepts and thinking. Although the purpose might be the same, at least from a media-technological standpoint, the objectives vary significantly. Artistic production is authorized by its percipients; the artificial by its immersed users. Admittedly, the previous sentence bears potential conflict, if both the artificial and the artistic happen to coexist in the same medium. Thus the beholder changes into the position of the interactive user, and art transforms into full-body immersive spaces.

But that is another story and would open up a new chapter, leaving behind an audience presumably evenly divided between curiousness and defense. How to decide?

But that's another story...

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Stefan Sonvilla-Weiss

born 1961, PhD; studied philosophy, graphics, art and design education and communication theory in Salzburg and Vienna. During the 1980s and 90s he worked as cross-over artist, multimedia producer, university teacher and project manager in national and international contexts. Since 2003 he is professor and head of the international MA-programme ePedagogy Design – Visual Knowledge Building at the University of Art and Design Helsinki, Finland. His publications include: (e)Pedagogy – Visual Knowledge Building. Rethinking Art and New Media in Education (2005) and Visual Knowledge Building in Contextual Media Culture (2007). Bern, Berlin, Bruxelles, Frankfurt am Main, New York, Oxford, Wien: Peter Lang.