

Electromediative art education

Introduction

Art has always been related via technology to the formation of material or energy. We know periods of stone, clay and metal cultures. Also organic materials have been since long a source of subcultures. A radically new level has been achieved in the time of artificial materials and especially in the case of novel technology. Here we change the perspective and look the idea of energy flows behind art. Especially electro-magnetism ¹ as an energy form has changed our tools and media.

In the differentiation of culture the “new electromediative society” ² is manifest also in art and via science especially in art education. All this is considered under subparagraphs:

Electromagnetism, mediativity, education (in art)

Varieties of art, poetics, intelligent action (in art)

All this is made with references to the developing electromediative markets.

The importance of electromagnetism is not only limited to the extensions of perception (remote sensing, micro sensing) and communication. Light for example is the source of life in many senses. The function of muscles, nerves and brains is based on low electronic voltage and all aesthetic perception and poetic action (eye, hand)

¹ Anastopoulos, Ch., *Particle or Wave* (Oxford, 2008), 85

² Oksala/ Lasker, G. E., Hiwaki, K., *Sustainable Development and Global Community*, Volume XII (IIAS, 2011), 73

can be studied from this perspective. Nowadays a majority of tools are electronic in general and in communication as well. That is why the electromediative society is already here and what we mostly need is a suitable term and a name for it³.

Electromagnetism and Art

Electromagnetism fills our space, but is only partially visible. Electric power is good medium when transforming and transmitting other forms of energy (kinesis, warmth and forms of nuclear power) for human use. In new technology we have to notice the forms of electromagnetic spectrum ⁴ as:

Telephone-, radio-, micro- (radiation)

(Infrared-, light-, ultraviolet- (radiation))

X-, Gamma-, Other Background- (radiation)

The use of telephone waves has changed our world in few last decades (NOKIA et al). Before that radio, too, changed our communication radically. Also microwaves are in daily use, but have in art, except in architecture, only marginal applications. - Since long, light has had the decisive role in relation to life, man and also in art. Infrared and ultraviolet are on the border of light spectrum and have some use especially in architecture and show-business. - X- rays are used in medicine and technology and also in studying the layers of art. Gamma rays and background radiation still have

³ Oksala/ Lasker, G. E., Hiwaki, K., *Sustainable Development and Global Community*, Volume XII (IIAS, 2011)

⁴ Anastopoulos, Ch., *Particle or Wave* (Oxford, 2008)

only marginal meaning, except in the visualization of universe, mainly for study purposes.

Mediativity in Art

Art has always been partly a natural creation by talent, partly learning process in the use of media⁵. The history of artistic media is long, but here we concentrate to electromediative tools in analog or digital form. Camera obscura is electromediative early “invention” in analogy. Point, line and surface editors at CAD-time were digital tools for architecture, sculpture and drawing⁶. Great amount of such kind of tools has participated to the basic figure of artistic communication^{7 8} of form:

Author, work, receiver

(Media, resending, re-receiving)

Individual, collective, history

In electromediative situation author of art is equipped according to his choices with digital tools like lap-tops. The work under study is developing in material or in energetic form in electromedia. This is the reason why also the receivers need mobile mini-tools, communicators, computers; e-books, e-paint -platforms or mega-screens and cineramas in their daily life.

⁵ Saarinen, E., *The Search for Form* (Dover, 1948)

⁶ Radford, A., Stevens, G., *CADD Made Easy* (McGraw-Hill, 1987), 153

⁷ Oksala, T., *Philosophical Problems in Architecture* (DATUTOP, 1984), 52

⁸ Routila, L.-O., *Taidekasvatuksen tieteenala* (Clarion, 1985), 28

The artwork should be partly separated from e-form. But media is the tool to get the message “heard”. This means that the artist also continuously resends products comparable to the way graphics worked in the time of printing⁹. The receiver of art is then under the bombardment of messages and under the advertisement of better products and e-meditative tools.

Every individual has to make his castle of privacy and accept only certain forms of e-mediativity or ask someone to tailor suitable platforms. At the same time the possibilities of the collective around are bound to massive markets, but some sub-societies are probably still “iconoclastic”. Since World War II and especially AD 2000 we are forced to write a new history of art and notify the electromediative revolution.

In 1967 there was organized summer days in art education under the theme “Art and Cybernetics”¹⁰. The author also organized a summer event at Jyväskylä Art Festivals¹¹ on computational and formal art¹² under the title “An Algebra of Picture Algebra”. Today every school in civilized world has noticed analogous messages in the art education for children. This is natural because children have been born into the electromediative society and they “swim in it”.

⁹ Yates, F. A., *The Art of Memory* (Peregrine, 1958)

¹⁰ Ronge, H., *Kunst und Kybernetik* (du Mont, 1967), 64

¹¹ Oksala, T., *Kuva-algebran kuva*, (A picture of picture algebra, Exhibition in the Aula of Jyväskylä University during The Cultural Festivals of Jyväskylä (Jyväskylä Summer 1972) (Jyväskylä, 1972)

¹² Oksala, T., *Kuvataiteiden formaalit esitysmuodot* (Formal representational form of arts, Lecture at ESO, (Library of Art History, University of Helsinki)) (Helsinki, 1968)

Education in Art

Art is relatively old activity in human civilization. The oldest documents are classified as being technical, but real art is known since 20 000 – 30 000 years. Art was conceptualized in order to be systematically educated in Hellenism and the story of art education is many-splendored. From renaissance we know the perspective grid, which was material but also electromediative tool (Duerer)¹³. Today we have perspective programs in micro-computers which are serving digitally analog-like images.

In order to see the essence of art education we need key concepts like:

Teaching, learning/ study, communication

Exercise, test, achieved new skill

In recent electromeditive societal situation art teacher needs tools from classical to electromediative. Nearly every art school has projectors (digital-analog) and liquid chrystal panels and the like. The same holds for students. Teacher and students meet in studios or large e-mediative auditoriums, where audio-visualico-haptic tools are waiting. Also kinetic illusion is available (Cinerama). Other senses lack still their standard simulation tools (olfactory-, gustatory dimension).

The surface of ICT-tools is often effective and work for public needs. The production of artistically talent content via ICT waits still intensiveness. The situation is analogous to the problem of sketching in architecture. Standard drafting and

¹³ Gleininger, A., Vrachliotis, G., *Simulation, Presentation Technique and Cognitive Method* (Birkhäuser, 2008), 20

illustration has potential¹⁴, but dialogue between mind and combination of body and machine is poor. The solution to this problem can only be achieved via hard exercise and via continuous development of mind and mnemo-technologies^{15 16 17}.

In the Institute of Art Education in the University of Jyväskylä in spring 2011 a project was run in collaboration with Professor Pauline von Bonsdorff and the ALMONDe group (Azmin, Laapotti, Majurinen, Oksala Novel Desing). In the project mental governance tools of Eliel Saarinen were tested to represent the content of local garden suburb (City Beautiful Movement¹⁸). The results showed us, that mental modeling is the way to master environmental, artistic and meditative complexity at the same time. It is worthwhile to note also, that the son of Eliel Saarinen, Eero, used the wisdom of his father when designing the command suite for the President of USA during World War Two.

Varieties of Art

Art incubates in peace, but participates to cultural competition and development.

Architecture manifests human creative potentials (Aalto, in discussion 1963). The same holds to other branches of art, which include¹⁹.

¹⁴ Radford, A., Stevens, G., *CADD Made Easy* (McGraw-Hill, 1987)

¹⁵ Yates, F. A., *The Art of Memory* (Peregrine, 1958)

¹⁶ Martikainen, V., *Concepts and Mind, as Dynamic Memory-Systems Structuring, the Human Mental* (Helsinki, 2004)

¹⁷ Majurinen, J. Oksala, T., *Junaliikenteen informaatiokeskuksen toimintatapa* (Ratahallintokeskus, 2009), 61

¹⁸ Saarinen, E., *The City* (MIT, 1943)

¹⁹ Saarinen, E., *The Search for Form* (New York, 1948)

Architecture, sculpture, painting

(Drama, opera, media)

Music, dance, poetry

Architecture has been on pre-e-mediative level since the 60ies²⁰ and the first large conference on the subject was held in Berlin, 1979. Regent development in Virtual modeling has been also extensive²¹. Sculpture is archetypal form of art, but kinetic tools have associated to it and also light-art has been combined to environmental sculpture. Virtual body design has certain connection to classical role of sculpture²². Painting is supported by computer prints and electromediative screens of many kinds.²³ 2008 - Stage design²⁴ is a good example to discuss e-approach in theatre and media, which is literally e-mediative in so many aspects starting already from e-books.

Music started as one of the early e-art forms under the title “electronic music” promoted in the e-studio of Cologne by Karl-Heinz Stockhausen. Later computers were taken into account. In Finland the projects of e-music and e-architecture were started in 1963 in an informal meeting, where the main mathematician S. Mustonen

²⁰ Helamaa, E., *Arkkitehtikoulutus Suomessa 175 -vuotta*, (Rakennustieto, 2000), 69

²¹ Launis, T., *Tila, aika ja virtuaalisuus* (Space, Time and the Virtual), TUT-A (Tampere, 2006)

²² Wiedemann, J., *Digital Beauties, 2D and 3D CG Digital Models* (Taschen, 2002), 49

²³ Gleininger, A., Vrachliotis, G., *Simulation, Presentation Technique and Cognitive Method* (Birkhäuser, 2008) 40

²⁴ Larmann, R., *Stage Design* (daab, 2002), 184

from NOKIA lectured about the current computing power. The support of dance is nowadays also e-media-based. The control of music and light and scene in general is often electromediative. Finally we have the problem of poetry. Literature is more of content than form²⁵. It is relatively independent from media and we may have books, microfilms and e-books and what so ever representing the same content. The problem focuses here quite directly to intensions²⁶. In all arts the core of creation is symbolized by the term poesis. But the question is syn-artistic. Horatius has said: “Ut pictura poesis”.

Varietes of Poesis

Poetics is the original form of art theory having its emphasis in making rather than in aesthetics only. The name of aesthetics was taken in use as late as in enlightenment. Scientific and systemic study of poetics is manifest in the work of Aristotle²⁷ and has many followers even in recent times²⁸ in many branches of art like in architecture²⁹.

Every branch of art has its poesis, which looks all so different. In fact the idea of poesis is quite simple in the light of concepts like³⁰:

Idealization, notation, concretization

Realization, materialization/ energetic recording, actualization

²⁵ Oksala, P., *Ihminen, kulttuuri, taide* (Gummerus, 1976)

²⁶ Hintikka, J., *Kieli ja mieli* (Otava, 1986)

²⁷ Aristoteles, *Retoriikka ja Runousoppi*, trans P. Hohti et al. (Gaudeamus, 1997)

²⁸ Oksala, P., *Ihminen, kulttuuri, taide*, (Gummerus, 1976)

²⁹ Bachelard, G. *Tilan poetiikka* (nemo, 2003)

³⁰ Ingarden/ Oksala, P., *Ihminen, kulttuuri, taide* (Gummerus, 1976), 82

“Real” ideas are born in human mind and even they have their correlation via brains to electromedia. Brain is an elecromediative organ. The study of brain is extensive, but we should not confuse it directly to the problems of mind³¹. Notation technology, it is the direct transformation of idea to media, is still the weak link in e-art.

Developed tools are in their best when we go to more accurate forms of presentation. Line and color editors and collage technology work quite well at assisting level in art work.

The most radical achievement in computational art is still the idea to make all decisions needed by using e-platforms. Thus we may predict the outlook of the work under development quite well. The new form of materialization in art is thus energetic recording. Technology renders it also possible to come near to the actual effect of the work. Actualization, however, happens in our mind. And this process is electromediative in the sense that our concrete senses and brain collaborate in low-electronic mode.

Artist as perceiver and as actor has e-mediative dimension and may extend his/ her capabilities with artificial media. Nano-and bio-dimensions of technology may open new views to our story, which can not be exactly fixed yet. This fits well with the idea of art as open in essence.

Varietes of Intelligent Action

Artist, maybe, work and consumer in art is acting in multi-mode. These include forms like:

³¹ Friedmann, H., *Das Gemueth* (Beck, 1956)

Creation, solution, reaction

Imitation, function, automation

Creation is still in great extent a secret. Brancusi has stated, that “art comes from the subconscious and what deeper that better”. This does not mean that creation is outside of the idea of e-mediativity, but rather vice versa. The truth is that our knowledge only is limited. Human problem solution in general and also in art has been simulated in AI. Architectural problem solution has been a pioneering field ^{32 33 34 35 36 37}. Art is continuous reaction to the events of cosmos and art itself. One new thing is naturally based on the idea of reacting work of art. The development of hypermedia ^{38 39} and e-games illustrate this line of development path.

Imitation is one of the oldest key terms in art theory and theory of art teaching. It has various interpretations, but what is important is that the accuracy to imitate has been

³² Oksala, T., *Logical Aspects of Architectural Experience and Planning* (Otaniemi, 1981), 2

³³ Coyne, R., *Logic Models of Design* (Pitman, 1987), 3

³⁴ Rowe, P. G., *Design Thinking* (MIT, 1987), 46

³⁵ Gero, J. S., Oksala, T., *Knowledge-Based Systems in Architecture*, APS Ci 92 (Otaniemi, 1989), 119

³⁶ Niiniluoto, I., *Kauneus ja informaatio* in M. Lammenranta and V. Rantala, *Kauneus, Filosofisen estetiikan ongelmia*, Suomen filosofinen yhdistys (Tampere, 1990)

³⁷ Linn, B., *Arkitekturen som kunskap* (Byggeforskningsrådet, 1998), 28

³⁸ Radford, A., Oksala, T., *Creative Memories and the Finnish Sauna*, in T. Oksala, G. L. Farre, G.E. Lasker (eds.), *Design: Emergence, Content*, APS Ci 106 (Otaniemi, 1996)

³⁹ Tyrkkö, J., *Fuzzy Coherence: Making Sense of Continuity in Hypertext Narratives*, Department of Modern Languages, (University of Helsinki, 2011)

dramatically grown due to e-media. Complex simulation is a tool in art and in its education⁴⁰. Functional action is mastered due to the gathering of information and when using control to fulfill our intentions⁴¹. The complete knowledge about certain processes makes it possible to automate. Already Aristotle mentioned the idea to automate weaving and consequently the making of patterns associated⁴². This idea was first realized in the French “Jacquard loom” –machines at the end of 17th century. Joseph-Marie Jacquard developed such machines and the advanced version was ready in 1801. These machines become familiar in Europe in 19th century and in Finland around 1890. - This was one of the starts of the long route via continuing use of new tools in art, which grow exponentially in their potential and cuts now the borders of electromagnetism so dramatically.

Conclusion

We have formed a common theory joining the ideas of electromagnetic space, media in art and the education of these challenges. Especially important as a result is the synthesis between analog and digital potentials of computing.

Tarkko Oksala

Aalto University, IIAS

Helsinki, Finland

⁴⁰ Majurinen, J. Oksala, T., *Junaliikenteen informaatiokeskuksen toimintatapa* (Ratahallintokeskus, 2009)

⁴¹ Conrads, U., *Programme und Manifeste zur Architektur des 20. Jahrhunderts* (Ullstein, 1966)

⁴² Wilenius, R., *Filosofia ja Poliitikka* (Tammi, 1967), 18

Acknowledgements

This paper is based on the discussions with Joel Majurinen and Jyrki Tyrkkö. Also the discussions about the topic with Pauline von Bonsdorff and Tony Radford have been encouraging. I also thank my early teacher Professor Jaakko Laapotti and my latest “student” Assistant Professor Aida Azmin for co-operation on the field under the span (1968-2011) of various projects.