Does Virtual Learning lead to Sustainability?
A Critical Approach

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Abstract
People and their Societies are confronted with two phenomena: Production of immense information through an empiric-dynamical digital evolution. One product of this development is virtual learning. On the other side the idea of Sustainability, an idea of a better world rooted in political scenes, academically used to develop theoretical and practical proposals. To clear up the potential of virtual learning for sustainability, an interdisciplinary approach based on complexity is chosen. This offers to develop positive and negative categories of effects to understand the connection of both.

1. Virtual Learning in the Information Society

Information in itself is nothing new for nature, society and individuals. And learning as the specific capability of self-conscious humans to value information in its specific context to act and change the world either. Learning even allows learning how to learn. But in its whole range learning reached a new dimension by information and technological revolution because of its fast caused structural changes and pressure. In combination with the production of more information this process demands enhanced learning. Thus the information society is a learning society with an intrinsic pressure for everyone and even assumed as “lifelong learning”. One typical product of this technological wave is a new dimension in learning – virtual learning. Virtuality means an intrinsic power or possibility of learning by Internet and its combined media (Multimedia). Than virtual learning simple means “learning in the Net” (Schulmeister 2001, 2) as a new category of reality – a virtual reality. Even virtuality in itself offers ways to understand complex real behaviour through virtual self-organisation (Mainzer 1999, 114). So virtual learning opens new fields and approaches for a) whole systems and their institutions [science (e.g. medicine), economy (eBusiness), politics (democracy)], b) individuals themselves (proactive learning) and levels of cooperation (group, regional, national, international and global

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level). It’s obvious that virtual learning underlies didactic and methodological choices as well as “real” learning (e.g. reactive or modern proactive learning). The content may be even the same as or as bad as before. On the other side there can be a new mixture of synchrony (e.g. online conferences, online mediators, chat rooms) and asynchrony learning (e.g. tutorials, animation, Emails). A new situation evolves in using partially virtual learning beneath conventional elements of teaching. This opens to combine advantages of virtual learning with social existence. Virtual learning leads to a) reduction of transaction costs, b) flexibility (independence of time, place, work and even content), c) global choices, d) additional media competences, e) virtual cooperation, f) free access to information.

On a system level virtual learning is highly complex and self-organising because of its tremendous profit potential (capitalizing of human and intellectual potentials). A variety of private companies see a chance in participating in segments of continuing education (also strange universities like Mc Donald’s Hamburger “University”) (Schulmeister 2001). Even public institutions (e.g. universities) feel pressure and chances of globalisation and create market-strategies (new certificates and diplomas, supply in continuing virtual education) as well as new cooperation nationwide or international [e.g. Consortium Virtual University of Applied Sciences (North Germany), Baltic Sea Virtual Campus]. This process is joined by political recommendation and financial support to manage societies development in direction to a learning society (Bund-Länder-Kommission 2001). To conclude: Virtual learning is a significant part of societies current development coping structural changes and realizing new opportunities. There is a dynamic process building up new structures for virtual learning as well as developing new technologies for virtual learning (e.g. virtual agents or affective computing).

2. The Construction of Sustainability

What’s the entity of Sustainability? Based on the Brundtland-Report sustainability is at a first glance a (main western) political suggestion in coping men’s diverse problems with survival on Earth and secure future existence. Though also rooted in a narrow approach in German forestry in the 13th, its today made to be an extended version of an economic, ecological and social dimension. These dimensions are nothing new from a scientific point of view. But their complex combination in a process with states of harmony, tensions and even creative destruction is the crucial

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2 And sometimes connected with a spiritual dimension (e.g. deep ecology).
point. This makes appear Sustainability a bit fuzzy. Figure 1 shows the connected objects of Sustainability:\(^3\)

![Figure 1: Objects of Sustainability in Process](image)

And the way that this broad field is understood lacks of general accepted validity. Nevertheless politics are quite unified in knowing what sustainable development is and what has to be done (see e.g. OECD 2001). This is rooted in the concepts own more or less political-neutral consensus character with a promise of value-free operationalisation, which contains “objective” criteria (Ulrich 2001, 2). As a regulative idea Sustainability aims to discover suitable evolutionary paths as a learning process due to present dominant negative Sustainability.\(^4\) Options are to be learnt instead of mechanistic details.

In its scientific broad focus covering three dimensions various perspectives as mental constructions of Sustainable Development can be seen.\(^5\) Quite as an outlook

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3 An individualistic view of human being itself as a starting point is supported because of its acting significance as nucleus. Other views like the institutional one are possible. See Schneidewind 2000.

4 Sustainability can be thought in two poles of positive and negative Sustainability. In the poles of individual - society, global - regional, stability - instability too.

5 E.g. very weak or strong Sustainability as a result of anthropocentric / ecocentric position.
on life we do not know exactly at the moment a sustainable way because of lacking generally accepted knowledge in natural and especially cultural evolution. Coming from an outlook of life dealing with complexity several “organisational patterns” (Capra 1996, 185,251) as crucial parameters are suggested to understand the three-dimensional construction of “positive” Sustainability in the end of the learning-process itself. At least the answer to these patterns and their relations themselves shape the structure and the identity of the formed Sustainability as a “Leitbild” (model) in the end (Graap 2001, 214-310): a) openness of future (see e.g. quantum physics, chaos theory or possible autonomy and self-consciousness of humans); b) coevolution (resulting from embeddedness); c) communication [driver of development (see e.g. Habermas, Jaspers)]; d) diversity (to ensure possibilities for selection); e) ethics (integrating humans mental potential in judging “What is right?” and “What is to do?”); f) “good life” (integrating sensible categories for humans living); g) time-differentiation (integrating the time-dimensions of the process). Additionally to understand sustainable processes categories of connecting powers within self-organisation are important. This is a broad field. Some effects are mentioned with regard to virtual learning: feedback, bifurcation, lock-in, flexibility, learning, and self-reflection (Graap 2001, 310). From this approach it is obvious that Sustainability as a process in adaptation and shaping is evident just as science develops to understand self-organisation and its multidimensional dynamic. Probably acting in co-operation will be the dominant but not only type of action-type (Graap 2001, 460). Competition has its role too. But in a subtle dynamic relation concerning to cooperation in order to enable stability and instability, i.e. development. As a result Sustainability underlines humans development to democracy and freedom as well as individual and corporate responsibility in a complex world.

3. Bridges for Virtual Learning in Sustainability

Now it is possible to build bridges between Sustainability and Virtual Learning. To make it clear: Only virtual learning itself is no idea of orientation for a society or individual. The original core of information society is to create information. This is an empirical fact. Sustainability roots in ecological crises and is a complex approach in understanding to open a suitable path of orientation. A “sustainable information society” is then a wrong object because Sustainability is centred as entire development and not as an additive or reactive figure. Information is just one puzzle in that case which has to be developed over generating knowledge and self-reflection to reach learning and education. The following bridges can be recognized: a) learning is a main ingredient of Sustainability as a process; b) learning hits the three dimensions of economic, ecological and social Sustainability and all objects mentioned in

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6 A „sustainable cloning” as an unspoken example would make Sustainability an instrument.
7 Especially with regard to openness of future and coevolution.
Figure 1\textsuperscript{8}; c) self-organisation and entropy connect both;\textsuperscript{9} d) typical patterns of constructed Sustainability root in information and learning (coevolution and communication, ethics); e) individual perspective of Sustainability (education in discovering ones own potentials).

In addition virtual learning opens a new dimension for understanding realities and Sustainability itself – the virtual dimension. Virtual reality hits all real objects of Sustainability mentioned in Chapter 2. It even creates new sustainable dimensions (economic, ecological and social virtuality) on a self-organisational basis.\textsuperscript{10} Nevertheless virtual self-organisation does not escape thermodynamics. So this new dimensions of virtual Sustainability as a part of real Sustainability has its ground in reality. Concerning demands of self-organisation virtual learning opens a chance for enhancing feedbacks for flexibility and dynamic bifurcations as sustainable options, e.g. lock-ins for ecological B2B, B2C, B2A, A2C, C2C platforms. Or new understanding in judging positions from ethics. But contrary to present commercialism of virtual learning in the name of utilization virtual learning does not lead automatically to Sustainability. Not to weak or strong Sustainability. It’s a question of content, method and didactic. This leads to the next Chapter.

4. Effects of Virtual Learning for the Process of Sustainability

To clear up potential effects of virtual learning for Sustainability categories of positive and negative effects (“virtual effects” for Sustainability) are made. Positive effects can be used to develop sustainable strategies. Negative effects have to be integrated and solved.

a) positive virtual effects

- \textit{clarification \& democratisation}: clarification of existing worldwide knowledge and support of democratisation
- \textit{learning approach}: self-organisation of virtual learning (proactive); virtuality as a new motivation for learning (and than for Sustainability); self-directed learning instead of stiff behaviourism and dictated content\textsuperscript{11}
- \textit{virtual communication potential}: break down historical and spatial barriers and connecting through learning (people, generations, cultures); building networks
- \textit{scientific progress}: better understanding as a result of virtual modelling

\textsuperscript{8} Also in dialectical thinking (global – regional, individual – society, reality – virtuality).
\textsuperscript{9} There are arguments for rising and decreasing entropy (acceleration of material throughput, growing efficiency of computer and dematerialisation)
\textsuperscript{10} As well as virtual communication (Truscheit 2000, 288), cooperation and competition.
\textsuperscript{11} In this context an effect is assumed that divides companies who are able to deal with self-directed learning to improve their fitness and others who use it in order save their bureaucratic character. A new class of winners and losers develops.
• social: integrating people; contribution to build up “world ethos” (Hans Küng) or “global responsibility” (Hans Jonas, Dalai Lama)
• economic: reduction of transaction costs; allocation effect [“virtual nomadism” (Mainzer 2000)]
• ecological: ecological effects [e.g. traffic (Rolf 2000, 414)]

b) negative virtual effects

• learning approach: lack of methodical-didactical concepts (“real” content is only transmitted) and quality standards; learning wrong content
• social: degradation / no development of real social competences (social isolation); emotional dull; anxious of virtual learning; no orientation in virtuality learning (no media competences); no barriers between virtual learning and family/social world; addiction to Internet and virtuality; virtual learning is expensive for a lot of private persons and most of the people in the South\(^{12}\);
• economic: acceleration of product innovation and materialisation supported by eMarketing; linear development of virtual reality as economic growth ignores time differentiation; pressure to life-long learning for purely economic purpose (fact-learning); risk of lock-ins (virtual winners/losers) and tension; high cost
• ecological: lack of contact with nature (natural isolation); living in an ecological illusion of virtuality

Finally the question of this paper can be answered: Virtual learning itself does not lead automatically to Sustainability. But it offers positive virtual effects that can be used as options for strategies towards Sustainable Development. On the other side negative virtual effects have to be integrated and solved. Otherwise they impede Sustainability. A generally accepted theory of virtuality and Sustainability is necessary.

Bibliography


\(^{12}\) See e.g. www.open-ac.uk (Open University) or www.vg-u.de (Virtual Global University).