

## Towards an “organic” hybrid educational space - psychological aspects

(Extended abstract)

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1. Social transformation, economic challenges, and rapidly changing technological environments are all a challenge to education. Permanent technological advances offer newer and newer technology solutions. The increasingly complex world needs new skills and competencies. The evolution of the 4th Industrial Revolution, the ongoing development of the technological environment and the impact of changes in the socio-economic environment on education is illustrated by two extremities taken from Silicon Valley, in the world's leading edge of technology. One of these extremes is a Waldorf school<sup>1</sup>, which refuses to incorporate technology in the education process. The maximum technique applied by it is paper and pencil. The other extreme, AltSchool<sup>2</sup>, which the founders prefer to name Montessori 2.0, puts children into a technological environment. And many more solutions exist between these two extremes. ICT is incorporated into the school's everyday life in some ways, for example, a number of solutions are introduced to help to acquire some skills. However, they do not affect the whole educational model. It is important to emphasize that the most up-to-date technology solutions may help the education process and various solutions may become part of the educational space, however the basic education philosophy and the relating education model are unchanged. Moreover, the education space augmentation by the use of ICT and virtual space solutions are realised in a relatively few, mainly private and/or experimental schools<sup>3</sup>.

2. The situation in the schools of mass-education still exists in a dual reality: that of the physical reality of the school with some elements of ICT support and that of the reality of the virtual space. These two realities coexist only and the necessary skills for the orientation in the virtual space are taking shape spontaneously without allowing the development of the corresponding necessary competences.

This can be so mainly because of the lack of an adequate education model, which could integrate the two coexisting realities into a well-balanced hybrid educational space. Here are some of the most important problems caused by the lack of this afore mentioned adequate education model:

- (i) Some very important literacies cannot be developed on their own such as critical thinking, critical media literacy and ethical literacy.
- (ii) Learning more and more takes place in episodic situations thus the personal knowledge acquired by it would also be episodic.
- (iii) Personal knowledge development forms a stable system less and less mainly because of the influence of the virtual information space.
- (iv) The cause-and-effect analysis and reasoning is becoming increasingly overlooked and given its place to data-centric and superficial attitude.
- (v) The knowledge-based (e.g. model-based) reasoning is becoming increasingly overlooked and replaced by a set of knowledge fragments that correspond to various events and episodes resulting a casual superficial attitude.

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<sup>1</sup> <http://waldorfpeninsula.org/>

<sup>2</sup> <https://www.altschool.com/>

<sup>3</sup> K. Robinson, L. Aronica, Creative Schools: Revolutionizing Education from the Groun Up, Allen Lane, 2015

(vi) Theoretical foundation of various problem domains is no longer considered important and the learners concentrate only on the action-oriented algorithms and prescriptions.

An important consequence of the above is that most of the learners are no longer able to distinguish between correct and true versus incorrect and false data and information.

Knowledge corresponding to the episodic events is not only specific to times and places, it is also largely specific to the individual whereas structured knowledge, i.e. systemic knowledge is mostly shared among individuals in a given culture, although its precise scope depends on the individual's experience<sup>4</sup>.

3. New culture and socio-economic conditions require a new education approach together with a new education philosophy. Moreover, this philosophy should even work for the mass education the aim of which should be to prepare learners for the continuous development of their skills and knowledge. This way they would be not only individualized consumers of ICT-based information spaces and media, but would also have the capacity to represent their own interests, to shape and communicate their values and become critically thinking, creative members of the society. For the mass-education orientation we have proposed a new educational philosophy developed on the basis of a new metaphor. We have proposed to substitute by an organic metaphor the industrial model of education based on linearity and conformity and batching people<sup>5</sup>.

The main education objective of the proposed new education philosophy is to ensure the development of learners' skills and competences to enable the individuals to become able to give an adequate response to all possible changes in the natural, artificial and socio-economic environment throughout their entire life.

This educational philosophy opens a real prospect to revolutionarily improve mass education system. It permits (i) the organisation of highly productive educational space, (ii) the organisation of individual education within the system of mass schooling, (iii) to take into account the fast changing educational, scientific and technological environment, (iv) to stop the contradiction between the educational goal of the society and that of the individuals.

The proposed education philosophy gives a special content for the concepts of knowledge and knowledge formation. Especially, the proposed philosophy deals with the concepts of information and knowledge in real and virtual environments. Therefore, an appropriate theory of mind is proposed, according to which, knowledge is a special organ of mind. Humans acquire knowledge and the growth of knowledge-organ goes through freedom-based self-regulating activities. At the same time, a new theory of learning is formulated, shifting towards cognition-based learning from the earlier authority-based learning. Education processes in this framework are connected to self-regulating development, which can be represented in the proposed model of mind.

The proposed education philosophy deals with the educational space and environment and also with the methods that can support the efficient personal development, while learners can effectively realise their potentials. This philosophy also deals with the practical education processes and with the education model that permits their realisation. It assumes replacement of knowledge transfer by growing knowledge and competences while, at the same time, it maintains active interest and mobilises all individual capacities of the learners. The proposed model suggests to create such an educational environment (open and self-structured with

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<sup>4</sup> K. Patterson, P. J. Nestor and T. T. Rogers, Where do you know what you know? The representation of semantic knowledge in the human brain, *Nature Reviews, Neuroscience*, Dec. 2007, Vol. 8, pp. 976-987

<sup>5</sup> M. Balaban, T. Gergely, *Knowledge Transfer - Introduction to Macro-Informatics*, ALL, Budapest, 1992 (Second Edition: 2012)

balanced use of real and virtual components) in which each learner can find a sphere of activity according to his individual interests and capacities. This environment will make use of both technical and human resources; it will allow each learner to grow his corresponding competences and thus resulting in personal satisfaction.

The most important constituent of the education philosophy is that interest and curiosity are the main drives of the learners in their learning and cognitive processes. Personalizing this learning process suggests the idea that the pace, approach and context of the learning experience should be tailored to the needs and interests of the individual learners.

This philosophy also deals with the practical education processes and with the education model that permits their realisation. It assumes replacement of knowledge transfer by growing knowledge and competences while, at the same time, it maintains an active interest and mobilises all individual capacities of the pupils. The education model provides methods to build the education environment for the self-regulated learning processes driven by the personal interest. The main constituent of this model is the educational park of open studios, or park-school.

The park-school model suggests to create such an educational environment (open and self-structured with balanced use of real and virtual components) in which each learner can find a sphere of activity according to his individual interests and capacities. This environment makes use of both technical and human resources; it allows each learner to grow his corresponding competences and thus resulting in personal satisfaction.

4. The studios support the efficient personal development, while learners can effectively realise their potentials. By blending real and virtual education spaces a studio can enable learners to work at their own pace, be flexible in organising groups of learners according to their interests. The pedagogue of a studio who mainly plays the role of a consultant and supervisor is able to get a dynamic stream of information about where learners are doing well and where they are struggling.

Thus in the park-school model a learner starts with his/her interest. Then (s)he tries to find an adequate education space where the uncertainty related to this interest could be decreased. For this the actual interest may be turned (reformulated) into a problem to be solved. The solution of the problem may be achieved either individually or it may be embedded into a wider project and solved in collaboration with other learners. Thus one of the principles for organising education processes is as follows: start with your interest and go wherever it takes you. Along the education pathways where the learners are going from the appearance of an interest until the decrease of the corresponding uncertainty the learners are taking steps towards the development of the main competences such as criticality, creativity, cooperativity and communicability, i.e. the 4Cs. The organisation of the effective and safe education pathways is to be ensured by the pedagogues and is to be supported by appropriate ICT solutions. The pathways are realised in a personalised hybrid education space, where each learner is treated individually.

The park-school model allows to apply various learning methods while a learner's activity is supported to satisfy his/her interest. Some of these learning methods are as follows:

- Learning by discovering, experiencing and exploring,
- Learning by searching for information in the education space and later on in a more global information space by the use of problem-oriented approach,
- Learning through information management by the use of various information analysis methods,

- Learning by communication (e.g. by the use of persuasion and presentation methods in order to organize a group to explore interesting uncertainty of concern),
- Learning through collaboration and cooperation (e.g. by realising the vertical principle, according to which one learner gives consultation to an other learner, or by realising an efficient organisation of a group and learning the different functional roles of a group),
- Learning through transition of the information from one area to another by the use of various methods of similarity checking,
- Learning through model building, representation and simulation,
- Learning by using various methods of reasoning (e.g. by searching various similar cases in order to learn divergent way of thinking).

5. Three special methodologies are suggested to support the hybrid educational space such as:

(i) A methodology to support the application of various ICT technology and solutions to maintain a hybrid well-balanced education space which will help learning to work under uncertainty using different cognitive reasoning methods. The education space also supports the development of both divergent and convergent thinking and will be conducive to the development of creativity. The methodology suggests various ICT and pedagogical services to support the functioning of the creative space and, therefore, enables the learner's creative learning as well as the formation and evolution of creative teams.

(ii) A methodology to manage the hybrid education environment, which supports the collaborative use of the technological components and services of a studio together with the coordination of the collaborative group work. This technology will be able to control the orchestration of the services in order to create support an appropriate creative education space adequate to the given education aims.

(iii) Also, a methodology to help the development of structured knowledge. It is based on the so called knowledge capsule method<sup>6</sup>, which helps to embed even the episodic knowledge fragments into a structured knowledge system by the use of specific meta-analytical methods.

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<sup>6</sup> Simonyi, A., Gergely, T., Szóts, M., "A personal semantic model-oriented information retrieval system", 4th International Conference on Cognitive Science, Kaliningrad (2012)