ENABLING TRAUMATIZED CHILDREN IN GREEK REFUGEE CAMPS TO DESIGN THE FUTURE OF EDUCATION: UPDATE OF A PROJECT IN PROGRESS

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Abstract

If it were possible to demonstrate that severely traumatized children in refugee camps could be enabled to design the future of education, it would empower children worldwide to follow them. This is the rationale that guides the project described here in a situation which couldn't be more dramatic: on the one hand, we now know that education will determine the destiny of humankind, but on the other, given a future that is becoming increasingly unimaginable, we don't have the slightest clue as to what the future of education should contain. This paradox has characterized the state of education globally for decades and all attempts at reviving it have amounted to little more than kicking a dead horse. The present article leads the reader into a methodology and ethos which together show a way out of this dilemma along empirically proven principles.

Keywords: *developmental neuroscience, self-organized learning, physical and virtual reality, community learning utility and the integration of refugees, mothers and the evolution of language*

LEARNING AND EDUCATION DETERMINE THE DESTINY OF HUMANKIND

Let us begin with a few clarifying words about the relationship between *Learning*, *Education* and *Knowledge*. *Learning* is our biological heritage and we employ it individually to adapt to physical, behavioral and social changes in the physical and rapidly emerging virtual environment, and to use the information thus acquired to cope with similar and novel situations and problems in the future. Whereas *Learning* is the act of an individual, *Education* is the social establishment and management of *Learning* for use to the advantage of the individual and others at some future point in time and is usually associated with a particular institution or institutions. To learn is to do something by yourself, to educate is to do something to someone else. Finally, *Knowledge* is the entity which is traditionally said to be maximized by *Education* and it refers to some of the most complex kinds of human behavior, so it is not surprising that *Knowledge* has rarely been clearly defined or effectively implemented in evaluating educational practices. Typically, most *Knowledge* acquired in *Education* is *verbal*.

"Enabling traumatized children in Greek refugee camps to design the future of education" poses two challenges: The first is the effective treatment of early traumatization before and during life in a refugee camp, which itself can be, and oftentimes is, traumatizing. The second challenge is to enable these children to design what the world now needs most: *education for a future that is becoming increasingly unimaginable.* For nowhere do we find any indicators or guidelines which could provide a foundation for urgently needed and empirically-guided education during our journey into the unknown and therefore as yet unmappable territory of *cyberspace* (the term 'unmappable' is used in cartography to describe 'complicated mathematical transformations that can be hardly realized without substantial geometric distortions', personal communication, Liqiu Meng, 23.06.2022). More than 50 years of clinical and scientific work focused on child development has led the author to the conviction that more than anything else, *education in the future tense* – a phrase coined in a book entitled *Future Shock* published in 1970 by the most important but unfortunately now almost completely forgotten futurist of our time, *Alvin Toffler* (1928-2016) – is what will decide on the future of humankind.

Recent demographic research (Lutz et al.2014) suggests that Samuel Huntington's thesis about the 'clash of civilizations' (1993) proves to be secondary to a far more fundamental conflict in many parts of the world, a conflict which will ultimately decide over the fate of *Homo sapiens* on planet earth. This is the clash between two diametrically opposed collective attitudes towards human learning and education: the first is *a society based on embracing continuous individual and cooperative, future-*

oriented learning and education and is set against the second collective attitude based on *enforcing ignorance for the prolongation of traditional inequalities between groups of people, like the ubiquitous inequalities between men and women*. Viewed through the lens of present-day empirical demography, which has added education to age and sex in its methodology (Lutz et al. 2014), Huntington's 'clash of civilizations' is in reality a primordial *clash between supporters of learning and education on the one hand and supporters of ignorance on the other*.

On this background, one key challenge facing us has been made visible in its gigantic numeric dimension by incorporating education into the demographic stratification equation of population growth in Africa in the near future: Lutz et al. (2014) have shown that in 2050, the African continent will be home to 37% of all of the world's under 18-year-olds. In absolute numbers, this means that about 1 billion young people – in only a single generation of 30 years – will massively impact the future of humankind. Under fortunate educational circumstances, these newcomers to the planet can forge their way into a bright future. Under difficult circumstances of *not being able to realize their innate biological potential to learn*, they represent the greatest human danger potential the planet has ever been confronted with. Population growth indicators consistently imply that only learning and education *on a massive scale* can prevent a global human catastrophe the likes of which the planet has never known.

METHODOLOGICAL CONSIDERATIONS

One might ask why we chose *an experimental approach* to tackle the complex behavioral challenge of enabling traumatized refugee children to design the future of education? The answer is simply because correlational statistical analysis and inference alone cannot provide the interventional data needed to explore and manipulate the epistemological and social variables addressed in this project. Shrewd experimental practice and its methodologically stringent analysis is what is required if the project is to bear fruit and the data generated by it are to provide a reliable road into the future of education based on the path-breaking potential of these data. It needs to be emphasized here that *behavioral research methodology* — historically developed in the behaviorist tradition of psychology with a paradigmatic view of behavior (possibly even including the movements of cut flowers in a vase over time) as exclusively belonging to the domain of natural science — *is employed explicitly as a measurement yardstick to demonstrate the effects of experimental conditions on resulting behavior as clearly as possible*. To enable conclusive answers to the questions raised in the project under discussion, it is the conviction of this author that no other methodology in the unbroken and tremendous expansion of neuroscience since the end of WWII, including psychology, can offer better research tools *behaviorally* than the ones employed in *a functional analysis of behavior*.

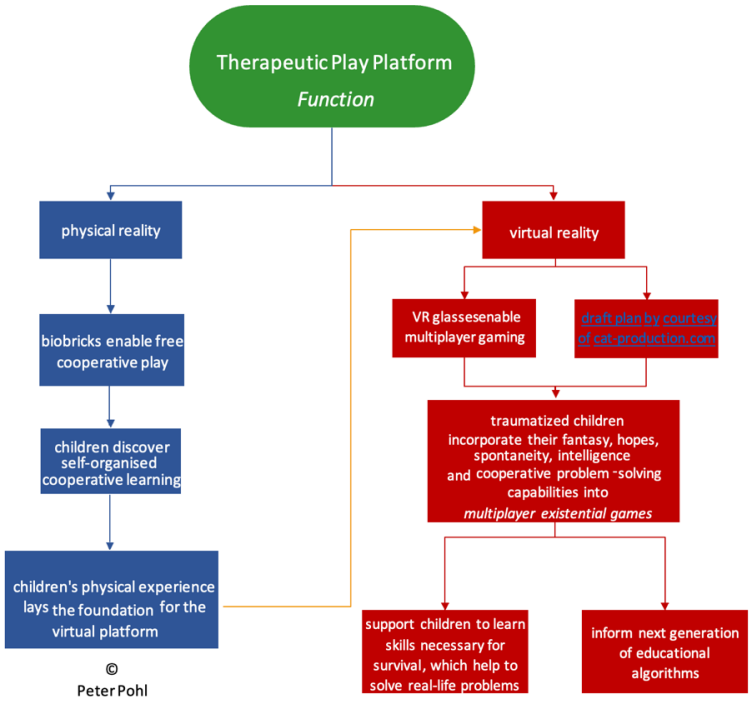


Fig. 1. Flow chart of functional Therapeutic Play Platform (TPP)

The core experimental project space is the *Therapeutic Play Platform (TPP)* illustrated functionally in Figure 1. The diagram represents TPP *Function*, subdivided into physical and virtual reality.



Fig. 2. Biobricks 24 x 36 cm (courtesy of Prof. Vera Meyer, TU Berlin, Dept. of Applied and Molecular Microbiology)

In *virtual reality* children wear cardboard frames which, when combined with mobile phone screens, make for perfectly functional VR-glasses (Fig. 3). Linking cardboard VR-glasses with appropriate eye tracking technology, children manipulate *virtual bricks* by focusing their eyes on the bricks' digital rendition in a single or multiplayer game mode with the same degrees of freedom as in physical reality. Again, individual and group behavior is continuously recorded on video and stored for subsequent machine learning analysis.



Fig. 3. 6-year-old boy with cardboard VR-glasses

Employing this experimental design, systematic intra- and inter-individual comparisons are enabled between physical and digital behavior in individual children and in groups of children who spontaneously emit self-organization of physical and virtual play. As in physical reality, children in virtual reality are encouraged to play and to organize their activities themselves or with the help of their mothers if desired.

We know that children's physical experience with biobricks in small groups (of 3 to 6 children) enable them to discover self-organized, cooperative learning, which in turn is the physical experience that lays the foundation for their digital behavior on the virtual part of the TPP. Within virtual reality, children will be prompted by their mothers and staff to discover solutions for practical problems on the basis of their innate capacity for self-organization and engage in what we call *multiplayer existential games (MEG)*. This is are a new genre of multiplayer game played by two or more children, which combines physical exigencies — such as food, shelter, clothing, sanitation, safety and protection — playfully in a gamefied virtual environment and encourages the children to employ their innate capabilities such as curiosity, intelligence, fantasy and hopes, to solve in a cooperative way various practical problems related to life in a refugee camp (such as obtaining nourishing food or warm clothing). In this context, the children and their mothers will be prompted to implement a '*Camp Learning Utility'* (CLU1) that serves as a local digital learning hub for self-organized problem-solving and informal learning *for all interested children* in a given camp. Solutions found in CLU1 function as a prototype for future education modules and inform the next generation of educational algorithms. At the same time, CLU1 serves as a blueprint for a *Community Learning Utility* (CLU2) in the Greek host community of the refugee camp, a topic to which we will turn in point 3.

The methodology used to demonstrate the effects of therapy is straightforward: To assess TPP intervention effects on Post-traumatic stress disorder (PTSD) in traumatized refugee camp children using classical single-case behavioral science methodology (Sidman 1960), we employ a) the internationally accepted Diagnostic and Statistical Manual of Mental Disorders (DSM-5) diagnostic criteria for PTSD to assess therapeutic effects of the TPP *in children below 6 years* (DSM-5 PTSD<6Y) and b) DSM-5 diagnostic criteria *in children 6 years and older* employing Trauma-Informed Care in Behavioral Health Sciences (Exhibit 1 3-4). By comparison, DeYoung and Landoldt (2018) maintain that "preliminary evidence suggests that the ICD-11 criteria might not appropriately capture PTSD in young children"(p. 97).

In *the domain of future education*, the effects of TPP exposure on traumatized children from 3 to 12 years of age are assessed employing behavioral science methodology elaborated by R. Douglas Greer

in his seminal book on 'Designing Teaching Strategies — An Applied Behavior Analysis Systems Approach' (2002), with a strong focus on *the Learn Unit* as the basic measure of pedagogy. Recent years of close cooperation with Doug Greer and his team at Teachers College of Columbia University led to a number well-received joint publications (Greer et al. 2017; Greer et al., 2020; Pohl et al., 2020) and have provided the author a) with an in-depth understanding of the applied behavior analytic principles that underlie a systems approach to the design and implementation of advanced applications of applied behavior analysis to teaching, b) to an appreciation of functional behavior repertoires from the perspective of behavior selection and verbal behavior, and c) to a comprehensive view of organizational behavior analysis as a support system for expert pedagogy and curricular design.

On the premise that *we consider the refugee camp to be an experimental space*, applying behavior science methodology to demonstrate *learning in severely traumatized refugee camp children* in both reality domains of the TPP is the key to an understanding of the broader social and political implications of the project described here employing the following simple logic: *If significant learning effects can be demonstrated experimentally in severely traumatized refugee camp children, then the Therapeutic Play Platform (TPP) morphs into a Pedagogical Play Platform (PPP), which in its turn can be employed to enable learning in all non-traumatized children*. We are not concerned about confounding therapeutic (TPP) and pedagogical (PPP) effects of the experimental platform on the children's resulting behavior. On the contrary, many years of clinical experience with exceptional children have taught the author that clinical and pedagogical aspects of children's behavior are two sides of one and the same coin of facilitating children's healthy development. As mentioned in the Abstract, *the rationale that guides the project is that if we can demonstrate that severely traumatized children in refugee camps can be enabled to design the future of education, it will inevitably empower children worldwide to follow them*.

In terms of behavioral science methodology, we need to address four important questions in evaluating the experimental data generated by the project described here, in particular by the TPP and PPP: 1) the social significance of project data, 2) their scientific relevance, 3) their reliability, and 4) their generality.

1) The social significance of project data generated on the TPP *particularly for developing countries* is captured in the exemplary demographic projection of African youth described above. Without digital literacy as the key that unlocks both 21st Century economy and culture, these upcoming generations will be the prey of fundamentalist organizations that use illiteracy to terrorize the uneducated and to perpetuate ignorance in the poor. Of particular bio-social interest concerning TPP methodology is *the inclusion of digital learning in virtual reality*, because digital media represent a technology of consciousness which, when used by children and adolescents who oftentimes play the role of early adopters, alters the physiology (function) and anatomy (structure) of the central nervous system (CNS), *particularly during its phase of most dynamic development between gestation and pubescence*. In this context it should be mentioned, if not underlined, that in the emerging discussion of the new role of education in demographic analysis and prediction (Lutz et al.2014), no mention has been made of the relationship between virtual reality and gaming on the one hand and the enhanced plasticity of the CNS during development on the other — as if we had suddenly forgotten how comparatively easy second language learning is *before puberty*, *and how difficult thereafter*. There are many other important aspects of the social significance of both TPP and PPP data which need to be dealt with in more detail in forthcoming publications.

2) The scientific relevance of project data is well expressed in a paragraph from German sociologist *Ulrich Beck* in his pioneering analysis of the *Risk Society – Towards a new modernity* (English translation 1992 of German original 1986) as follows: "What is sought is a pedagogy of scientific rationality which will conceive of that rationality as changeable by discussion of self-produced threats. Different from the case of the theory of science, which presumes and attempts to reconstruct the rationality of science from its historical status quo, the knowledge claim of science becomes a *future project*, which can be neither refuted nor gained from the forms of the present alone. The proof of the irrationality of the prevailing practice of science no more means the end of science than the refutation of Newtonian mechanics meant the end of physics. The precondition for that proof is to transfer the substantive abilities for criticism and learning, which were traditional in research practice, to the

foundations of knowledge and the application of it. At the same time, that would mean the elevation of the *actually latent* reflexivity of the modernization process into scientific consciousness. But where modernization encounters modernization, this word also changes its meaning. In the social and political application of modernization to itself, the interest in mastery that is spread in this way loses its technical grip and assumes the form of 'self-control' and 'self-limitation'. Amidst the tumult of contradictions and new doctrinal disputes, there will perhaps also arise the *opportunity* for practical self-domestication and self-alteration of the techno-scientific 'second nature', its forms of thought and work" (p.181). Radicalizing Beck's approach to re-defining scientific rationality, the author ventures to submit the following hypothesis: *the scientific relevance of the experimental data this project will produce lies in their epistemological potential to revolutionize our understanding of causality and with it the structure of consciousness.* If this sounds familiar to some readers, it may be due to their cognizance of the (yet to be fully appreciated) philosophical implications of quantum physics. Readers interested in following up on Beck's work since his path-breaking introduction of the concept of a 'risk society' in 1986 would, like the author, presumably struggle with but greatly profit from assimilating his torso, "The Metamorphosis of the World" (2016), written before his sudden death in 2015. It is a curious coincidence that during the same period, the author was working on conceptualizing the speech development of children in terms of the biological phenomenon of behavioral metamorphosis.

3) The reliability of project data is established through systematic intra- and inter-subjective replication of experimental conditions across reality domains (*physical* versus *virtual* reality) and varying group constellations such that one and the same child can consistently be shown to be continuously less anxious in groups of different children, thus demonstrating that the child is less traumatized than it was when it began the program. Trajectories of anxiety level will be defined behaviorally for each child across time, number and type of experimental condition and an *individual Anxiety Quotient (AQ)* calculated that expresses quantitatively the development of self-confident social behavior within changing groups and environmental challenges (such as the above-mentioned multiplayer existential games [MEGs] in mixed virtual and physical reality domains). Inter-subjective comparisons of AQs across reality domains and environmental challenges over time ensure child-designed and child-paced construction of the *Camp Learning Utilities (CLU1)* as the collaborative and focused aim of all individual *Camp Quests (CQs).* In turn, the CLU1 serves as orientation, guideline and blueprint for a subsequent *Community Learning Utility (CLU2)* in the Greek host community surrounding the camp and thus functions as a transmission belt for the successful integration of refugees in a given region. Indeed, a CLU1-generated CLU2 would be the most conclusive and valid type of empirical demonstration of the reliability of project effects — an outcome entirely in reach.

4) The generality of project data rendered through statistical analysis has long become the *sine qua non* of psychological methodology for practically any type of project evaluation. As mentioned, an experimental approach has been chosen here with a view towards the import of the data generated and their potential for generalizing implementation of the project on an EU and perhaps international scale. Once the methodology has been validated in Greece, which, given ample funding, could be done within 12 months, *the Volkswagen Workforce Foundation* has expressed its interest in writing of funding generalization of the project play platform to sub-Sahara Africa beginning with Nairobi, Kenia. In allowing for generalization of both variables and processes, internationalization of the play platform would establish *methodological generality,* thus opening the way for further application of the play platform model to increasingly rising numbers of forcibly displaced individuals (as a result of educational ignorance, persecution, conflict, violence, war and human rights violations), particularly with large refugee flows from the Ukraine since the beginning of the Russian invasion in February 2022, now approaching 100 million refugees worldwide in mid 2022 according to UNHCR figures. No question, the need for treatment of traumatized refugee children is increasing staggeringly as well as the corresponding need for education in the future tense as the only sustainable solution to the dual curses of illiteracy and poverty.

PUTTING THE DATA TO WORK: FROM THE CAMP LEARNING UTILITY (CLU1) TO THE COMMUNITY LEARNING UTILITY (CLU2)

As we have seen from the foregoing section on methodology, the children and their mothers are the ones who design and pace the physical and virtual learning modules on the basis of their innate capacity for self-organized learning. We should thus begin this section on implementation with a few words on the ubiquitous phenomenon of self-organization.

Conceivably, self-organization could be considered the bedrock of play behavior with all of its temporal; spacial and cultural ramifications. In the social sciences, self-organization is also called spontaneous order. It consists of a process in which some form of overall order arises from local interactions between parts of an initially disordered system. Self-organization occurs in all sorts of systems in nature: physical, chemical, biological, robotic and cognitive systems as well. The process is spontaneous and does not require control by an external agent. Triggered by random fluctuations, it is often amplified by positive feedback. Thus, the resulting organization is completely decentralized and distributed over its components. And as such, self-organization is typically robust and able to survive or self-repair substantial perturbation. Of interest is also the circumstance that Chaos Theory discusses the phenomenon of self-organization in terms of islands of predictability in a sea of chaotic unpredictability.

Some 20 and more years ago, the Indian physicist and educational technology expert *Sugata Mitr*a made, with his famous '*Hole in the wall'* experiments (Mitra and Rana 2001; Mitra et al. 2005), one of the most astonishing discoveries in the field of learning and education in the past 100 years and they clearly touch on the phenomenon of self-organization Mitra gave groups of unsupervised children from a slum in New Delhi access to the Internet by mounting a functional computer in a hole in the wall, then left the kids to themselves for a couple of days, only to come back and see them playing intensly with English apps of all kinds in a language they had never learned. Since that serendipitous discovery, Sugata — whom the author met in England as Professor of Educational Technology in the School of Education, Communication and Language Sciences at Newcastle University during Easter 2017 — has repeated his hole in the wall experiment many a time in many a country all over the world with basically the same results, which he summarizes succinctly in the following four key findings (Mitra 2020, p. 291):

"1. Groups of unsupervised children, given access to the Internet in safe and publicly visible spaces, can figure out how to use the Internet, irrespective of who or where they are. We call this Minimally Invasive Education (MIE).

2. Groups of unsupervised children, given access to the Internet in safe and publicly visible spaces, can learn anything by themselves. These are called Self-Organized Learning Environments (SOLEs) (SOLE,2020; Start SOLE, 2020).

3. The presence, physically or virtually, of a friendly, encouraging adult, enhances self-organized learning as listed in #2. Such intervention, when through the Internet, is called "The Granny Cloud" (Mitra, 2009; thegrannycloud.org, 2017).

4. Minimally Invasive Education, implemented through Self-Organised Learning Environments and the Granny Cloud, is called a School in the Cloud (Mitra, 2020; theschoolinthecloud.org, 2020)."

The author is in contact with Professor Mitra, now at the Tataha Kim Laoratory of NIIT University in Rajasthan, India, who is presently considering consulting the author during implementation of the Therapeutic and Pedagogic Play Platform (TPP and PPP) during the course of the project with a view towards establishing a functioning Camp Learning Utility (CLU1). Once CLU1 has been established and proven to function according to design and under refugee camp conditions, the stage is set for employing CLU1 to implement a so-called '*Community Learning Utility'* (CLU2) f*or the region hosting the refugee camp.* The intention here is, of course, to establish a social mechanism which would enable the integration of at least the traumatized children and their mothers (or other caregivers) from the refugee camp into the hosting community surrounding the camp through *the value added* ***to*** *the hosting region by traumatized refugee children and their mothers in establishing a CLU2* ***for*** *the*

region. A quarter of a century ago, the author and his British colleague, *Terry Edwards*, conceived and drafted the idea of a Community Learning Utility (CLU) in a manuscript never published in English but translated by the author and published in German at the time (Pohl and Edwards 1996). In what follows, the original unpublished English draft — which today, apart from the ICT employed, would seem to be just as relevant, if not even more so, in terms of its logic, scope and, in particular, *strategic political import*, than it was in 1996 — serves well to expand the Greek model into the European dimension, a good 25 years after the CLU was conceived:

3.1 Community Learning Utility – Key to the European Learning Society

Peter Pohl and Terry Edwards (Unpublished Manuscript 1996)

3.1.1 Introduction

Knowledge and the acceleration of information are among the most important resources in the dawning age of the information society. In the future, value creation of countries will increasingly depend on the existence of efficient forms of learning and their utilization by the population. 1 Innovation is only possible through consistent learning and the use of newly acquired knowledge.

In the future, forerunners will be nations whose societies have made lifelong learning a social and employment policy priority. Europe must become such a learning society beyond national borders. This need has become unmistakably clear through the ongoing debate on economic location in recent years. In a global economy increasingly based on information and communication, Europe can only sustain its position commercially and culturally through intelligent and cooperative forms of learning.

Adopting the learning society requires the choice of the right form of organized learning as a next step. In this context, it is important and at the same time unavoidable that individuals find qualified learning opportunities in their local communities and municipalities and make use of them accordingly. Community learning is enabled by democratic decisions, as only those allow learning resources to be accessed and provided to individuals. In this respect, the concept of a "Community Learning Utility" is of great political as well as economic importance for the unstoppable arrival of community learning and teaching.

Learning is organised by the community as a public utility service. It thus becomes comparable to standard utility services such as gas, water, and electricity. In practice, this can only be realized through electronic networks. The community learning utility must not be seen as technological magic; rather, it must be endorsed, accepted and used as a citizen-oriented educational innovation (see Figure 4 below).

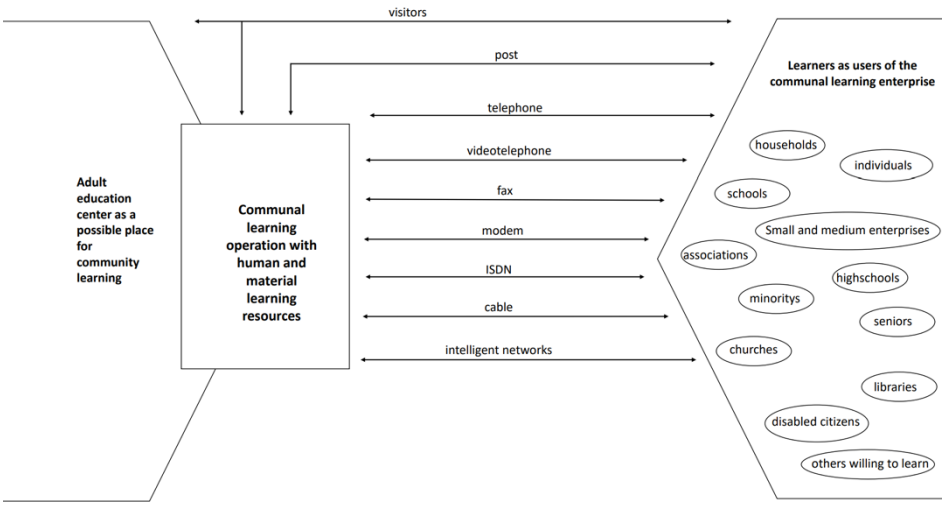


Fig. 4. Realization concept for a community learning utility

As with other utility services, there must be a network provider responsible both technically and organizationally for community learning. Culturally and commercially, the unique opportunity for the network operator consists of developing and offering intelligent networks for learning to communities of all types. The aim thereby is to create opportunities for their use in the present and, especially, in the future. It is thus possible for the network provider to establish, configure and secure the future market at a very early stage.

The community learning utility involves bundling of learning resources and use of the technical possibilities to open up education and training to everyone in the community who is willing to learn. The definition of community is only of minor importance in this context: the latter can be a town, district, county, but also an industry. The only important thing is that learning opportunities – just like the traditional utilities of water, gas, and electricity – are available everywhere in the community to anyone willing to connect. To the extent that individual as well as collaborative/cooperative learning becomes accessible to the individual through the community learning utility, the usefulness of the new communal service increases for the citizen and proportionately for the community as a unit.

The provision of community learning and teaching needs to be matched, of course, to the individual's needs for access, including the ability to provide learning services to all citizens. In practice, this will lead from simple telephones to so-called intelligent networks. When learning resources are emphasized time and again in this context, it is especially the teachers in the public education system as well as those in the business education and training sector who are addressed.

For all who are interested in using the community learning centre, access to the latest multimedia learning programmes, geographically remote databases, online services and even tele-cooperation facilities, usage must ultimately become - due to the increasing intelligence of the networks - as easy as using water, gas, and electricity. The previous aspect is not only important for the individual but also for the community, as the necessary economic basis can only be achieved through a continuous increase in the use of community learning.

3.1.2 Community learning creates solidarity

If we want people to work and learn through electronic networks, this requires a high level of acceptance and trust in the new technologies. Just how little this has been the case to date, can be seen from the fact that potential users have been extremely hesitant to adopt modern interactive telecommunication services. In practice, considerable barriers to the acceptance of new media and services still need to be overcome. They can be seen on multiple levels: particularly on the level of the organization, but also in legal and psychological domains.

A great amount of attention must therefore be paid to the desired participation of citizens in the establishment and maintenance of their community learning utility. The human-psychological basis of local cross-linking is the Local Learning Network. It is of great importance because it must be seen as a participatory, future-oriented collective learning process. The Local Learning Network creates the necessary foundation of trust and consensus for the acceptance of community learning as a citizens' movement based on solidarity. With regard to individual citizens, it is important that they understand and accept lifelong learning as a process of securing the future together.

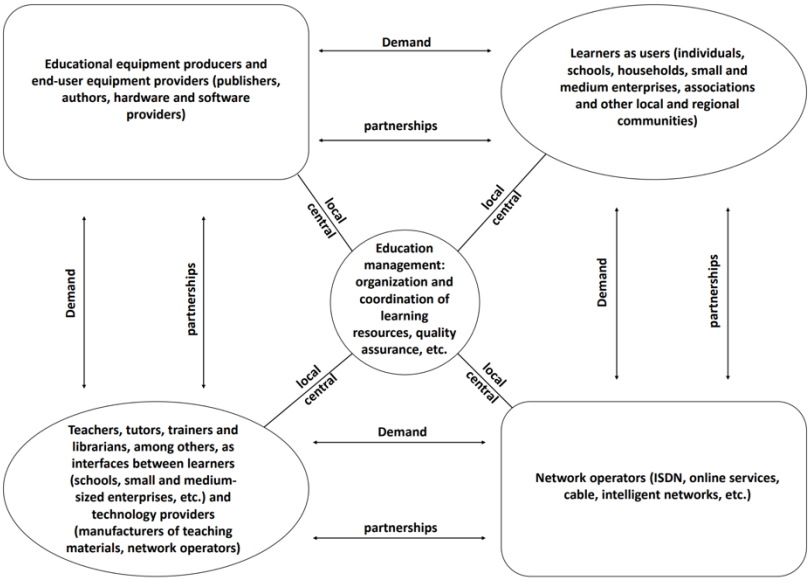


Fig. 5. Local learning Network as a community learning process (the main participants and their network of organized partnerships based on mutual needs)

The Local Learning Network (see Fig. 5) is made up of all providers and users of learning resources in what one might call "the community learning enterprise". As a process, different partnerships result from groups of people with mutual needs. Learners as users of the Local Learning Network can be individuals, households, schools, businesses, or other communities within the framework of a related group of people with shared interests. Interfaces between learners and technology providers are educators in the broadest sense, including, for example, teachers, tutors, trainers, educational counsellors, librarians or even psychotherapists. Among the technology providers, there are manufacturers and providers of hardware, software and learning content, such as publishers. And finally, there are the network operators, who provide access to the network and its high-quality services for those who want to learn.

The rapidly growing demand for the production and consumption of learning resources, combined with the increasing inability to finance traditional public education from traditional public funds, forms the basis for a variety of new partnerships between the participants of a local learning network. Numerous new professions and thus new jobs will be created through such partnerships, with countless variations conceivable.

For example, a school and a network operator could cooperate with each other. In this case, provision of ISDN connection and online services for the school automatically secures the usage structure for the network provider's services. Publishers and teachers can also cooperate in the development of urgently needed learning programs for the school and extracurricular sector. The development of the extensive homework market should be mentioned in this context. A promising basis for many partnerships between the various participants also lies in the field of computer-based training in primary and continuing vocational education and training. Special opportunities arise here, especially with regard to the rapidly growing need for further training of small and medium-sized enterprises everywhere in Europe.

In any case, it is important to understand the local learning network as a collective learning process which results from multiple partnerships and mutual trust. This is precisely the socio-psychological basis of the entire learning process. By contrast, the dynamics and orientation of the various partnerships are determined by the cultural and commercial benefits of the Local Learning Network for the individual partner and for the community as a whole.

3.1.3 On the economics of community learning

The economic efficiency of the Community Learning Utility critically depends on the network structure and use of the system. One of the preconditions is the availability of end devices, whether these are personal computers, modems or printers. They must not only be available in households and businesses, but also, for example, for visitors to schools, libraries, youth clubs and churches. In addition to investment in hardware, there is a need to spend money on software in the form of learning programmes for individual use, PC video conferencing systems for tele-cooperation or groupware for cooperative learning. Furthermore, there are also expenses for various transmission services, for example, the retrieval of learning programs from an educational server for multimedia learning programmes or the use of various online services.

The requirements are met by the fact that there is currently a large market potential for the mass use of multimedia and telecommunication services due to the falling costs of terminals and peripherals. Parallel to this market development, performance of hardware is also increasing rapidly. All of this is accommodated by the fact that more and more companies are deciding to experiment with teleworking and tele-cooperation. These developments indicate a rapidly approaching and far-reaching structural change in the world of work.

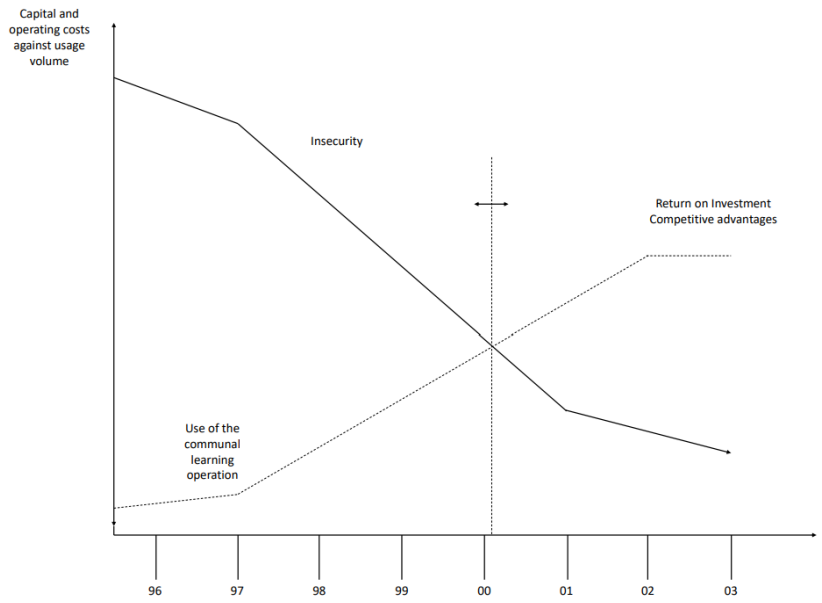


Fig. 6. The community learning utility as a catalyst for medium-term local economic development (investment model)

The community learning utility can become a catalyst for local economic development in the medium term (see Figure 6). As with many other goods and services, the costs of using the community learning utility decrease in proportion to the volume of its use. In terms of budgets, the preconditions for community learning are most likely to be realized by upgrading the telephone network to an area-wide integrated services digital network (ISDN). The ISDN is relatively inexpensive compared to the broadband network and yet offers heretofore unimagined resources for advanced learning systems. The broadband network will definitely come one day, but currently it is still too expensive as described above.

It is certainly no exaggeration to claim that community learning creates the possibility of triggering new waves of founders both in Germany and throughout Europe. This is because community learning starts at the interface between the public, commercial, and private sectors - in other words, precisely where the greatest potential exists for mass use of the new learning products and services.

3.1.4 Labour market and competitiveness need new learning solutions

Europe's greatest challenge at the moment is structural unemployment. Even with moderate economic growth and simultaneously rising corporate profits, structural unemployment continues to increase. And precisely because of this, competitiveness is disguised — which in turn puts pressure on economic growth and thus triggers a vicious circle: more unemployed people lead to higher social spending, but higher social costs destroy jobs. Community learning offers a way out of this vicious circle.

According to this logic, some categories of thought need to be abandoned. This is especially true for the concept of work. Traditionally, work has been conceived exclusively as quantitative performance in the sense of interchangeable jobs with constant qualification requirements. According to this school of thought, unemployment can be eliminated by creating new, almost identical jobs. For the industrial past, this was definitely true.

In the new information society, the traditional concept of work falls short as an economic category. In this society, knowledge and its systematic development are among the most important resources. The consequence of this is that qualifications are constantly changing. In a significant manner, value creation is now based on the formation of knowledge, the foundation of which is individual and cooperative learning. Structural unemployment can thus no longer be eliminated by the infusion of capital plus the provision of new, essentially identical jobs. Rather, individual knowledge must now be transmitted, which can only be accomplished through learning.

This change has been observed for some time at the European level and is now expressed more prominently in the German labour market. While jobs with low qualification requirements are constantly being eliminated (Schumpeter's famous 'creative destruction'), the demand for jobs with higher qualifications is continuously rising. 3 Despite the continuous expansion of education in recent decades, the supply of qualified domestic specialists is no longer sufficient to secure Germany's long-term competitiveness as an industrial nation. As a result, solutions for both teaching and learning, viable thus far, are now facing extinction. In addition, many companies shy away from training skilled workers themselves due to cyclic economic fluctuations. As a result, even qualified labour is now migrating to low-wage countries. If Siemens moves part of its software development to Bangalore, then "Made in Germany" will simultaneously be replaced by "Made by Siemens". Such a development, which will have many undesirable consequences for Europe, can only be encountered with imagination by grafting community learning artfully into human development on a population level.

3.1.5 Intelligent networks as the infrastructure of the future European learning society

The phenomenon contained in the catchword jobless growth, which is simply growth without the creation of new jobs, has hardly been understood in its societal implications. Jobless growth can disrupt the European social order to its foundations. As a result, the social market economy will morph into a completely free market economy, which will profoundly change the forms of work and life in Europe. A learning society based technologically on intelligent networks, together which a culture of lifelong learning, must be Europe's answer to this epochal challenge. A starting point is that the European Union declared 1996 to be the "Year of Lifelong Learning". This lends expression to the fact that it has become essential to radically break up the stiff old ways of life with their rigid succession of learning, working and retirement and to move forward into a life of continuous learning. This is precisely what community learning presupposes.

The expansion of community learning in Europe can only be realized through an intelligent, Europe-wide network infrastructure. The blueprint for this European learning society explicitly requires exploitation of the continent's cultural diversity. In today's rapidly changing world, there cannot be enough emphasis laid on diversity in learning to meet the demanding digital skill needs of an increasingly globalized society. Comparable to genetic diversity, the diversity of learning forms also protects against extreme changes in environmental conditions. 4

The need for learning through intelligent networks is emphasized by the White Paper of the European Union, by the Bangemann Report and by the recent G-7 Conference. However, the widespread

implementation of community learning can only be realized on the basis of a universal, open network platform. This is the only way to open up and provide access to all learning resources and services to everyone. However, more than just increasing network intelligence is required for the future success of digital networks. Indeed, it is a matter of strategic orientation for Europe to keep a democratic eye on the emerging utilization structures of the future learning society. This is the only way to anticipate tomorrow's increasingly more intelligent education solutions today.

The pragmatic relevance of the concepts presented here is that as a service, the Community Learning Utility can already be implemented under current social, political and technological conditions in Europe. Unnoticed by most players, the pathway to the future European learning society already exists and its central navigation hub is the Community Learning Utility (CLU).

A HYPOTHESIS ON THE PIVOTAL ROLE OF THE MOTHER-CHILD RELATIONSHIP IN THE EVOLUTION OF LANGUAGE

By any criteria, the most intimate, intense and long-lasting human relationship is the mother-child bond. Before explaining the hypothesis mentioned above, a short biographical excursion will help the reader to understand how important pieces of the puzzle fit together. In 1979, together with Prof. Hellbrügge and Dr. Lajosi of the Children's Center Munich, where he had a position at the time, the author gave seminars in Developmental Diagnosis in that great city in India then called Bombay. There he saw how the poorest of poor mothers from the nearby slums, who oftentimes slept in the streets with their families, how they deeply loved and cared for their children (see Figure 7).



Abb. 6 und 7: Bilder aus dem Neurokinesiologischen Seminar mit Dr. Lajosi.

Öffentliche Gesundheitseinrichtungen bieten für jeden indischen Bürger unabhängig von seinen finanziellen Verhältnissen eine moderne, mit der europäischen durchaus vergleichbare medizinische Versorgung an.

Hatha-Yoga-Therapie der cerebralen Bewegungsstörungen

Nach dem Seminar stellte der Cheftherapeut des Instituts, Mr. *Mokashi*, das von ihm eingeführte Konzept zur Behandlung von cerebralen Bewegungsstörungen vor. Dieses Konzept beruht auf der systematischen und nach Schwierigkeitsgraden abgestuften, die Symmetrie und Asymmetrie der Körperstellungen berücksichtigenden Anwendung von Yogasanas.

Diese von *Mokashi* ausgewählten und von ihm als „Schlüsselstellungen" bezeichneten überlieferten Hatha-Yoga-Übungen sollen die normale neuromuskuläre Entwicklung und das emotionelle Gleichgewicht fördern, die Flexibilität und die Effizienz der Herz- und Lungentätigkeit erhöhen sowie eine Reinigung des Respirations- und Verdauungstraktes bewirken. Die Wichtigkeit der Ausdauer bei den einzelnen Körperstellungen und der täglichen Übung zu Hause wurden besonders betont. – Es wurden mehrere, nach dieser Methode behandelte Klein- und Schulkinder mit cerebraler Bewegungsstörung vorgeführt.

Der Nachteil dieses, auf aktiver Mitarbeit des Kindes beruhenden Behandlungskonzeptes ist, daß es bei Säuglingen nicht angewendet werden kann. Aus diesem Grund war das Interesse für die Behandlungsmethode nach *Vojta* von seiten der indischen Physiotherapeuten verständlich, deren Konzept durch Dr. *Lajosi* „außer Programm" kurz zusammengefaßt vorgetragen wurde.

Seminar über „Münchner Funktionelle Enwicklungsdiagnostik"

Das Seminar in Münchner Funktioneller Entwicklungsdiagnostik, 1. Lebensjahr, fand vom 7. bis 14. Dezember im Institute of Child Health des J. J. Hospitals in Bombay statt. Die Organisation des Seminars übernahm Prof. *Udani*, den Dr. *Pohl* bereits im Sommer desselben Jahres auf einer internationalen entwicklungsneurologischen Tagung in Prag kennengelernt hatte. Die Anzahl der Seminarteilnehmer betrug 34; davon waren der größte Teil Kinderärzte bzw. Kinderärztinnen und zwei klinische Psychologinnen; darunter befand sich auch ein Kinder- und Jugendpsychiater.

Praktische Übungen und Diskussionen

Der Großteil der indischen Teilnehmer des Lehrganges ist in der kinderärztlichen Ausbildung tätig. Am Vormittag von 11.30 bis 13.30 Uhr wurden jeweils die einzelnen entwicklungsdiagnostischen Funktionsbereiche anhand von Dias und von den entsprechenden Filmen besprochen. Die Filme erwiesen sich als didaktisch besonders wertvoll, da Einzelheiten der Ausführung einzelner entwicklungsdiagnostischer Aufgaben genauestens vorgeführt wurden. Ferner dienten dieselben Filme ohne Ton als effektive Kontrolle des durch den Kurs erworbenen Wissens.

Abb. 8 und 9: Bilder aus dem Entwicklungsdiagnostischen Seminar mit Dr. Pohl.

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Fig. 7. Photos from Seminars in Social Pediatrics conducted by the Children's Center Munich in Bombay, December 1979 (upper two pictures Dr Lajosi: Neurokinesiology, lower two pictures: Dr. Pohl: Developmental Diagnosis, from Lajosi & Pohl, 1979, p.930).

For decades thereafter, either working in the children's clinic or later as a practitioner of clinical child psychology in his own office in Garmisch-Partenkirchen, Germany, despite all of the differences between cases, the message he received many times a day was always the same: *mothers' unconditional love for their children*. Working with individual cases of psychological, emotional, behavioral and social problems of all kinds in children between birth and 21 years of age and their families, consumed the author's interest to such an extent, that his broad research activities before he had begun his own practice (see references 11 and 16 to 24) completely stopped for about two decades. At the end of this phase a strong urge emerged to make something meaningful out of the rich reservoir of clinical experiences collected during some 20 years of work as a practitioner. Based on his particular scientific interest in speech development and its disturbances during childhood, the author set out to find a lab which might complement this particular interest of his. And indeed, he soon found a group around Professor R. Douglas Greer of Teachers College, Columbia University, specialized in basic and applied verbal behavior analysis, who with no ado whatsoever invited him to collaborate on subjects of mutual interest. This enabled intense and very stimulating work in Doug Greer's team of highly motivated and gifted associates on speech development which, within a period of about six months, led to a complementary conceptualization of speech development couched in ethological terms and focused on the developmental phenomenon of *metamorphosis*. A book chapter and various joint papers were published (7,8,28), which, according to *Research Gate* regarding the papers, are well read.

In the context of the hypothesis yet to be formulated, it is important to note here that in Pohl et al.. (2020), a first mention is made of the possible role of mothers in the evolution of language (p. 223) based on Tecumseh Fitch's formulation (Fitch 2004) of what he has called the selection of “mother tongues”, defined as “systems of communication that have evolved in the context of kin selection” (p. 275). Some of the most important characteristics of human language from an evolutionary perspective can be explained in the context of kin-selected communication systems. The mother tongue hypothesis – namely that language primarily evolved in a context of kin communication - not only provides a good overall fit to much of the existing data but a solution to some serious problems left standing by other models. Fitch concludes by noting that, “The advantage of this positive selected force over the sexual selection assumed by earlier workers is twofold. First, it accords with the fact that language learning begins in early childhood rather than at puberty, and second, it is expressed in both sexes rather than preferentially in males” (p. 292).

We now turn to a further part of the evolutionary narrative. Although it's a long shot, a major complementary piece of the story of the potential significance of the mother-child relationship in the evolution of language could be found in Ester Salgarella's 'rethinking the relationship between Linear A and Linear B' in her refreshingly modern interdisciplinary analysis of '*Aegean Linear Script(s)'* (2020) in Bronze Age Crete and Mainland Greece. By integrating linguistic, epigraphical, palaeographical and archeological research and placing one of the sites of origin of the emergent linear code into its socio-historical context, Ester Salgarella has opened up new perspectives on what one could also consider to be the nascent symbolic skills associated with the acquisition, retention, adaptation and transmission of an emergent communication code called *linear script*. The author has been very fortunate in having been able to communicate with Ester Salgarella recently concerning the possibility of cooperating with respect to the potential role of the mother-child relationship in the discovery of linear script during the prehistoric Bronze Age period in the Aegean, enabling a focus on nothing less than a *time during which, from an evolutionary perspective, the foundation for a differentiation of vocal language into written language was laid* in the Gestalt of simple and composite iconographic signs eventually drawn *linearly* into soft clay tablets. A lack of linearity may have significant developmental implications, both ontogenetically and phylogenetically. In the context of Linear A structure, for example, Salgarella notes that “It is worth observing that any linguistic study of a corpus language is, to an extent, a structural examination of a writing system, inasmuch as it involves an investigation of the relationship between the phonemic and graphemic components, as well as the structural characteristics, of the given system (e.g. spelling rules)” (p. 9). The chances for cooperation will presumably depend on the prospects of integrating current behavioral science research methodology with recent methodological advances in anthropology and palaeography – plus,

of course, solving the issue of finding sponsors who would finance such a seemingly outlandish research project. But, as the saying goes, where there's a will, there's a way.

I now turn to the hypothesis announced in the title of this section and draw attention to the opening sentence again, which emphasized that "B*y any criteria, the most intimate, intense and long-lasting human relationship is the mother-child bond ". That said, the hypothesis states that there is sound empirical evidence based on clinical and demographic facts, good evolutionary theorizing and a brilliant research scenario which could confirm the hypothesis with prehistoric data, such that the mother-child relationship will soon be seen to play a pivotal role in the evolution of language.*

Readers interested in the punchline of this pro-active paper can challenge both their concentration (and composure possibly) with a final conclusion and outlook as follows.

CONCLUSION AND PROSPECT

There is reason to believe that our primary nonvocal communication code - linear strings of visual symbols for phonemes, which for numerous centuries now has been the basis of our cultural skills of reading and writing leading to, among many others, texts and books, discovered sometime between 3000 and 1000 BCE in places like Mesopotamia and Bronze Age Crete, is, with exponential velocity, being repressed by a photon-based communication code - somewhat like the pictures on cave walls eons before the advent of linear code or *linearity*, for short – but now with *synthetic pictures* enabled by technological applications of basic research in quantum physics some hundred years ago with photography at that time as one of the first apps. *Face Book* founder *Mark Zuckerberg* uses the term *Multiverse* to denote the vast, immeasurable virtual reality in which we, *meaning mainly our children,* already live. Some readers will now begin to understand more fully why the author has chosen to include VR *and mothers* on the Therapeutic Play Platform (TPP). In clear distinction to some of his colleagues from child and adult psychiatry, the author has refrained from condemning digital media for its potential of *non-substance or behavioral addiction* as in video game addiction, because the way he perceives the big picture is that in essence, we are in the midst of a planetary shift in communication code towards a non-linear, pixel-based form of communication with synthetic pictures as the next manifestation in the evolution of language *qua* symbolic behavior.

Given his lifelong immersion into childhood, youth has long ago converted the author to futurism and to the conviction that to really move forward in our present situation, *we need to enable children to show us how to use digital media creatively to solve some of our more pressing problems. This is the whole point of education in the future tense.* In '*The Age of Surveillance Capitalism'* (2018), social psychologist *Shoshana Zuboff* describes very clearly what the author has been observing in the past decades, namely how digital media are robbing children of their childhood and using their digital footprints to exploit them for surveillance capitalist marketing purposes. With the project background explained in this light, it makes good biological and cultural sense to include mothers on the TPP and if the children through their participation in the project become addicted to a life which includes hope in the presence of their mothers, presumably not many people would have objections.

Given respect and the right to play, and beginning in Greece with exemplary beacon projects that lead to community learning utilities, mothers and their traumatized children from refugee camps will show us the way into the future of education and will be the influencers to emulate for future generations of liberated, happy and socially engaged children. Their example will be the lights of the beacon in projects that show us the way into a meaningful future.

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