

The risks of virtual learning

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Abstract

I dedicated myself to the explicative phenomenon, its multiple aspects and dimensions forcing me to a prolonged interdisciplinary study, synthesized in my doctoral thesis. I deepened the problem of the instrumental support for valuable didactic rituals in some Canadian instructional design projects. Enriched by these experiences, and provoked by the conference's title, I want to signal the drawbacks and risks of "technologising" education. The propagandistic invocation of "modernization" or "efficiency" can cover other goals: creation of a perpetual educational market for reproducible, low-quality solutions. Some circular justifications may also arise (signalling degenerations). From polemics fed by antagonistic convictions (progressive versus conservatory views) to consensuses based on "paradigms" – the "technology versus education" debate reveals the absence of an integrative science.

Keywords: instructional design, distributed cognition, explanation model, knowledge management, neo-colonialism, moral responsibility of science

1 Introduction

The passion for the explanation phenomena has polarised 30 years of my multidisciplinary research. It was provoked by the revolt against certain flows of the Romanian education (expressed in two critical works that called for the system reformation), but also by the fascination for those ennobling the condition of teacher or author. The irony of destiny made that, after working in the direction of computers design (software and hardware) and of their use for the composition of educative programs, after an academic tour in Canadian context, I return to Bucharest to launch an alarm signal.

This position paper, with an assumed polemic (even provocative) character, expresses some moral and political concerns, exposing the conclusions of my experience. The background of the argumentation is a personal vision regarding the explicative phenomenon, developed jointly with the investigation on the ecology of spiritual communities based on it. Two of my study's conclusions are relevant. The first is "physiological": the explanation is essentially a bipolar phenomenon, a human consonance that sustains the propagation of knowledge in community. The simulation (artificialisation) possibilities of *good* teachers are severely limited. The other is epistemological: the phenomenon of education is extremely complex, requiring hard-to-synchronise interdisciplinary efforts.

2 The physiology of education, between continuity and modernisation

2.1 Media and learning, an endless debate.

In publications dedicated to "instructional design", several positions on the media-learning relationship have been confronting from a long time.

An expressive example is the polemic launched in 1994 in the Educational Technology Research and Development (*ETR&D*, 1994) Ulmer reviews various theoretical currents, concluding that the misunderstandings come from a different perception on the physiology of complex systems. Clark reaffirms that learning can rely on any instrument, if it takes place according to well thought and adapted *methods*, the change of a communicational technology not having pedagogical advantages. Kozma sustains, with experimental arguments, that the problem is open to the future, when media *will* be able to create pedagogical opportunities. Morrison considers the arguments unconvincing and suggests abandoning a sterile question. The responses of the others interveners allow the observation of a large spectrum of paradigms, from constructivism to social cognition- that Jonassen et al. synthesize, concluding that the real problem is the study of the global process of learning *with* media. Reiser signals the distinction between the problem's pragmatic and theoretical dimensions. Shrock admits the legitimacy of principle and method contradictions, signalling however the risk that the theme's complexity paralyse the scientific aspirations of the educational technology. Clark retorts, showing that only the study of the methods leads to general results and to the conservation of valuable traditions tied to abandoned instruments. Kozma brings new arguments for the thesis that instruments, methods, and utilisation contexts cannot be separated. And Tennyson, signalling the vast map of implied aspects and the legitimacy of various visions, appeals to epistemological pluralism and tolerance.

Following the dispute hosted by No. 2 of the British Journal of educational Technology (BJET, 2003), dedicated to the impact of new technologies on education... we notice the problem perennality. Only that, this time, the confrontation is not between principle arguments and thoughts about future but between explanations of the situation found on terrain, in flagrant contradiction with the optimistic previsions. The conclusion of Nichol and Watson's editorial, that synthesises other contributions of this special issue, should arouse suspicions to those wanting to imitate the experiment: "Rarely in the history of education has so much been spend by so many for so long, with so little to show for the blood, sweat and tears expended". Conlon and Simpson show the similarity of the situation found in Scotland with that found in the USA by Larry Cuban (Cuban,2003)- that did not encounter the promised "value-added contribution" of the ICT. Reynolds et al. reveal the discrepancy between the reality of reduced computer use in schools and the bombastic rhetoric assumed by authorities. And Selwyn and Gorard reveal the mystification with statistical data and eloquent explanations.

This raises the question once more: can a new technology favour education? Are the facilities it brings in measure to counterbalance the losses represented by the modification of methods, the discontinuity of rituals and the necessity of learning the new techniques?

2.2 Education, technology and business

The opinions of analysts on instrumenting education cover a broad range, from techno-enthusiasm to techno-phobia. However, I do not know to what degree they really influence the confrontation, on the terrain of educational practice, between the agents of "change, modernisation, and progress" and the "retrograde, inertial, conservative" elements, resisting to "re-qualification" in the alert rhythm convenient for stock quotations, having to be continuously re-educated, adapted to new technologies (Postman, 1993). The explosion of rudimentary commercial projects has left far behind the thorough research on the effects of their use, on the optimal formulas for their educative exploitation and on their assimilation policies in traditional educational contexts. Domains like CAL, CBT, ITS, CSCL, etc - only try to catch up the train they pretend to steer, justifying its trajectory, post-festum. Narrow specialisation, that places synthesis subjects- like the management of socio-technical systems (Herrmann et al, 2004) - *between* various disciplines, leaves the task of establishing the educational strategy to politics, driven by corporatist interests. References to technologisation - as a refined weapon of neo-colonialism- are rare, both in technical literature (being out of the scope of its preoccupations) and in socio-ethical literature (inhibited by aspects transgressing its language). It is not easy to find a context to discuss such subjects, too technical for humanists and too humanistic for technicians.

Some theoretical debates are nothing more than marginal agitations, in the ivory tower of the scientific community. Others are used as doctrinaire arguments (instruments)- on one side of the barricade or the other. The real influence of these researches on the organisation policy of real instructional systems- is reduced. Society is driven forward by other... invisible hands. Who can evaluate the effect of kids' enthusiasm for video games- on the "informatisation trend"? And who will fight the techniques through which that enthusiasm is maintained, in the advantage of equipment-producing companies? Certainly not those who gain from the extension of this market- creator of business opportunities. The interested doctrinarians of countries exporting "educational products" and the bought doctrinarians of the importing countries will find the necessary arguments to sustain opportune thesis.

The fact that, even the critical observations regarding the shallow rhetoric of the "emancipating technology" contained in the "instructional technology" literature, do not venture in the explanation of some causes- is eloquent. The reader that has not lived the direct experience of the "scientific-commercial complex" will not learn, from these analyses, that behind silence and scientific pleadings hides the interest for continuously selling instruments and methodologies requiring wide markets. The perfect targets are the countries dominated by venal oligarchies- covered or not with democratic appearances. The ideal means are contracts made with corrupt functionaries of state institutions, covered by politicians bought by lobby groups. Receiving their tribute in discrete forms, the decision factors exhibit a modernisation passion, inclining towards using public money for technologising education (considered an investment) rather than growing teachers wages (considered as expense).

As I have shown in (Rosca, 2006) it is sufficient to launch certain projects, rendering the explanation of Pythagoras's theorem impossible... without a sophisticated instrument, requiring perpetual ameliorations and producing... many small benefices... at great distances. The system is conceived in the detriment of the physiological

autonomy of local communities, creating dependencies and continuous needs for "retechnologisation". In (Rosca, 2004), I explained the miracle of Microsoft's expansion and that of the enrichment of those that have insured their monopoly over the informational infrastructure, revealing the techniques of public manipulation and domestication, of cultural-economical satellisation, administrative authorities subjugation, concurrent creativity blocking-up (in the name of intellectual property protection) etc- to which the promoters-profiteers of the new technologies resort, shielded by alibis such as: improvement, adaptability, integration, portability, interoperability, distribution etc.

2.3 The engineering of community life and its pathology

Time works in favour of technological conquest campaigns, the accomplished fact creating a new context... that justifies it a posteriori. The more massively introduced, the more new instruments become really necessary, inevitable. They cannot be put away without endangering the informational metabolism. Citizens avoiding to be marginalized, must assimilate them. From tools, computers become goals of society and of education. The human condition is plastic. Having already risen from four limbs to two feet, the New Man can pass to supporting himself on 102 keys... Thought and language may be "digitalised" – to improve the dialogue with artificial partners – and standardized- to increase semantic inter-operation. The new student, created by the use of the new technology, adapted to it more and more profoundly, does not perceive the new rituals as alienating, degenerating or impoverishing. And the mediocre teachers that may fill up the new education system... deserve to be replaced by machines. No one will accuse the difference. The connection to the "global currents" can lead, especially in corrupt local contexts, to the mediocrisation, bureaucratisation and mercantilisation of education. But the voices of those that signal such risks (Olson, 1988; Salomon, 1998; Rosca, 2005- a text in which I deplored the introduction of grill-type examinations and the extinction of large participative tradition to Romanian Olympiads) are driven to anachronism and "radicalised" by the dominating stream. This irresistible dialectic seems to favour the forces of progress, despite the "errors" and the "collateral damages".

It is just a delusive appearance. In reality, it is specifically the fact that society forms a unitary and evolving whole, that the human and material layers reciprocally determine themselves – that creates great dangers and responsibilities. The instruments with which we enrich reality (among which we must include the models we use to understand and orchestrate phenomena) produce the change of the community's physiology and thus – that of its destiny. Plunged in the distributed cognitive system (Hollan et al, 2000) like cells in the metabolism of the organism enclosing them (Maturana and Varela, 1980), individuals are at their turn modified- through adaptation to the general evolution. This circle (determines cybernetically (Odobleja, 1979) the evolution of the human condition. But in the absence of socio-technical engineering, extremely problematic due to the complexity of the involved systems and processes (Le Moigne, 1990; Morin, 1990), the boomerang of technologisation strikes blindly: we know better and better how to construct worlds, without knowing how they construct us.

Passing from the classical informational tools to the "artificially intelligent" synapses, the possibilities for a metabolic modification grow considerably. Becoming aware of this fact, we encounter fundamental problems of social and spiritual ecology. Do the triggered mutations really emancipate the individuals and the mankind? The adoption of a certain philosophical position regarding the condition of the person integrated in the society- from individualism to sociality is determinant. This article's position (see also Rosca and Morin, 2000) is dual: individual existence/becoming and collective co-existence/evolution can be bundled in various formulas- on which the saneness and beauty of the human adventure depend. The observation of the "cognitive reality - semantic mirror" physiology offers possibilities for fighting the pathology of the community's cognitive metabolism but could also be used for its Orwellian orchestration (ruling). It becomes clear that a successful climb on the technological spiral (towards a better man in a better world) depends on the development, in tight correlation with the pragmatics of the WEB (Schoop et al, 2006) of an adequate socio-politico-moral strategy.

2.4 Technology of education, without a unitary scientific base

Unfortunately, as I have extensively shown (and explained) in my doctoral thesis, dedicated to the modelling of the explanation phenomenon (Rosca,1999), we are far from understanding the global physiology of hybrid systems continuously transformed by processes, in which persons- embodying evolving knowledge- and objects- carrying explicative messages- interact. The impressive number of: elements and phases, aspects and dimensions (semantics of the explained subject, logic and rhetoric of the demonstration (David-Hillel, 1990) shared representations (Vygotsky, 1962), physiology of co-action and of the communicational process (Wilmot, 1987), psychology of perception, understanding and memorisation, motivational and economical levers etc), criteria and methods, contexts and versions – require the simplification of the models, strategies and instruments.

For profound reasons, the "Technology of education" (Reigeluth et al, 1993) does not rely (yet) on a specific science, being obliged to see a unitary phenomenon through the multitude of prisms of a wide range of domains, each having its own primitives, epistemology, language, paradigms, experience, rituals, models and priorities. An integrative approach would be necessary. But the adepts of interdisciplinarity have not calibrated their methodologies by attacking the problem of modeling the "education phenomenon". And the program of the transdisciplinary movement (Nicolescu, 1996) is not yet backed by an adequate epistemology.

The design of instructional systems (Gagne, 1987) is an art, combined with methods for propagating the successful formulas (Scandura, 1996) validated by a hierarchic network of academic centers, mandated with "scientific authority". The paper flow continuously weaves a labyrinth of ideas, enforced by reciprocal citations and resorting to formal systems for evaluating the conformity to norms established by consensus. In the absence of a solid epistemological base (Spector, 1998) there are no guaranties that the collective research effort converges towards major synthetic truths, created by transcending details and condensing ambiguities.

2.5 Divided and strayed research

The epistemological fragility, the divergence of specialised disciplines, the aggressiveness of commercial interests and the democracy bureaucratisation contributes to the creation of an unhealthy atmosphere in many collective research projects involved in educational technology. The watch of pedagogical rituals degeneration by a "technologisation" driven by corporatist interests can not be made in projects subsidized by these companies. It would be normal that at least the studies funded with public money be dedicated to the community interest, signalling and sustaining emancipating solutions, preventing and fighting the pathology afferent to technological abuses.

Unfortunately, a gap has emerged between research and the practice it is supposed to assist and emancipate. Instead of being centres of intellectual watch, many institutions have transformed themselves in launching pads for new mass instruction instruments (Buston, 2003) with various action ranges, seedbed of redundant and useless software prototypes, anarchically developed by programmers that do not speak the same language than the researchers imagining the specifications.

For the series production of original papers, the academic furnaces "implement" projects in which the pretended beneficiaries are not involved in the progressive definition of "use cases", but only used at the end, a posteriori, to "evaluate and validate" virtual specification, according to sophisticated methodologies. The team members (believing they pertinently represent the education actors and can optimise the explicative processes through instruments) usually being: university researchers- with minimal pedagogical concerns and students- produced by a mass education system (where the profound explicative experiences are increasingly rare).

The situation becomes painful when the projects ambiguously oscillate- sometimes towards a prototype, sometimes towards a commercial product- under the pressure of "business partners" that impose the "deliverables" strategy, siphon public funds, confiscate people, privatise ideas and prototypes. Even in the more favourable context of the LICEF institute, the posture of conceptual architect, linking the research and development teams, has often been delicate, the programmers asking for clear specifications at the beginning of the project and the researchers wanting to end their activity with them.

2.6 A chain of projects aiming at managing the invisible

The goal that guided me along the series of projects dedicated to the exploration of the physiology of the educative process, equipped with modern communication and cooperation instruments, was the conservation of the fundamental explicative rituals (that permit spiritual reproduction). I looked for ways to interpose instruments between the two poles of the communicational pair, not for splitting it- isolating the information "user" from the "producer", but for facilitating its formation (as a synaptic net) and its blending (as a communicative prosthesis).

Between 1994 and 1996, within GRAEMI and HERON multimedia labs framework, I have studied the explicative messages' composition and their perception processes. I also have concentrated my attention on the "interaction mode" between the partners of a co-demonstration, joining (Rosca, 1999) in the "explicative mode" the elements determining the cooperation's physiology and separating them from the

explanation semantics. I approached the expert-computer-novice triangulation, specifying a virtual instrument called "NOVEX" (allusion to the NOVice - EXpert couple to which it would be dedicated). I pleaded for the valorisation of human intelligence and teacher art (Rosca, 1996) by the computerised synapses, the programmable agent being treated as a man - man interface. Then I have observed, between 1996 and 1999, in the TaxiNet and other WEB projects, the physiology of information transactions through the Internet.

I have extended these investigations participating in some large projects which aimed the modelling/ instrumentation of instructional systems distributed on the Internet: EXPLORA (a virtual campus management platform – Rosca and Paquette, 2001), MOT (knowledge structure, pedagogical scenario and resource conception/diffusion editor- Paquette and Rosca, 2003), ADISA (distributed workshop for learning systems engineering- conforming to MISA method- Paquette et al., 2001) etc. In order to deepen the research about the physiology of the ensemble formed by the procedural reality and its orchestrating model, I have piloted the prototypal development of a "function manager" (GEFO- Rosca and Rosca, 2003). This instrument was then used and refined in the context of the LORNET project founding a prototype that has illustrated the behaviour proposed for the TELOS system (Rosca and Paquette, 2004). I have defined TELOS' conceptual architecture so that it sustains the modelling and management of distributed instruction activities: from the emergent ones (searching human and material support resources and chaining operations freely) to the orchestrated ones (through rigid or adaptable scenarios). In order to support "semantic aggregation" (Rosca and Paquette, 2002) and evolved matching services for the optimization of "competence equilibriums" around pedagogical operations (Rosca,2005)- the proposed system uses a "knowledge layer" for referencing all the components: persons, documents and activities (Paquette and Rosca, 2004).

Thus, the circle of my research has closed: starting with the semantics (didactic) of the explanation, I passed to the physiology of its emission, perception and communication, from there to the instrumentation and the organization of instructional systems, to finally return to knowledge- analysing its global physiology.

2.7 In the defence of the didactical "pas de deux"

A complete systemic vision (Rosca and Morin, 2000) about explanation reveals its existence-becoming and spiritual-material duality. The physical and conceptual entities, tied by relationships, create systemic units and determine their behaviour (physiology). Conversely, the physical and cognitive processes sediment structures (entities and relations). That is why I have not adopted a pure "cognitivist – constructivist" paradigm but I combined these views with a "system- behaviourism" which allowed me to observe the internal physiology of the communicative human pair and of the cognitive communities (Tutdge et al, 1999). Synchronous or asynchronous, sonorous, textual or graphical, direct or remote, realized through communication, sharing or co-operation – the explicative relationship between an "expert" and a "novice" is essentially a bipolar phenomenon, based on the collaboration between two joined free-will decision centres.

As co-action and communication partner, the human assistant (appropriate, available and good-willed) has intrinsic qualities - difficult to mechanize. The

assistants' "artificialisation" is problematic – practically and ethically. The trainer art is to drive the learner on the "royal paths" of comprehension. Establishing the presentation order – is the finest part of the didactical expertise. Mechanical concatenation of "modules" in "courses" and "programs"- pretending to be adapted to the user- cannot compete with the quality of discourses- that intensely rely on explicative relationships between the message parts. The "reproductive" realizations, seeking "efficiency" - can lower the quality of education.

3 Conclusion

It is said that instruments are not bad or good- but all depends on who uses them, how and to what purpose, humans having the discernment and responsibility to choose. The organic conception on the socio-technical-cognitive system exposed here does not validate this assertion. It is obvious that a society that would have evolved without wheel, fire, motors, knives, gun powder, printing, television, computers, drugs etc- would have modelled a different individual and collective human condition. We cannot change all- in the lively rhythm convenient for "economical growth"- without changing anything... And the global effect of instrumental mutations is not deductible, due to complexity. Society cannot be left at the mercy of technological marketing campaigns representing companies' interests. Especially when we are dealing with the communication infrastructure that determines the physiology of the community's cognition. Therefore, the responsibility of researchers involved in "educational technology" - must be assumed.

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