Educational Technology in Crisis

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ABSTRACT

The polysemy of the Educational Technology field involves recognizing different conceptualizations of several theories of technology and their application to education in general and specially, to education mediated by ICT. The presentation of the historical epistemological path is needed to understand the above mentioned field towards a conceptual and methodological reconsideration of this special discipline articulated by the contributions of rupturistic theorists in order to reach a critical theory of technology and a revision of its field. We do not agree with the “instrumentalism and neutrality” of technology when stating that the “technological rationality” should be transformed into a “communicative and political rationality” as a cultural scenario of disclosure of hegemonic interests within homogeneous cultures: it is a social debate of civilizational alternatives as formative proposals in a mediated way. Educational Technology as a field is facing a deep crisis within a time of disruption, specially in the southern hemisphere and in contexts of migration (including nomadism and/or poverty). The technology should be “appropriate”, socially grounded and culturally adequate in its pedagogical mediations depending on diverse scenarios and actors, who will select and combine traditional elements to be delivered educational proposals in an electronic format.

Appropriate and Critical Technology is a special technological discipline and a knowledge field where we cultivate open and reflexive educational technological knowledge, towards research and contrast of the socio-educational practices mediated by pedagogical projects and materials articulated with ICT. Its study objects are the educational-technological mediations as historical – cultural – semiologic and didactic environments and tools in diverse formats which provoke different domains of the socio – cognitive structuring of learners in a situated and distributed way, inscribed within formal and non-formal, face-to-face and distance teaching practices.

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Introduction

1. Due to the polysemy of the field and the nomenclature of Educational Technology, it must be defined first, recognizing its diverse conceptualizations supported in turn, on different theories of technology that have reached education in general and today, education mediated by ICT, in distance and e-learning modes, as well as others associated as electronified manifestations of the educational phenomenon.
2. These conceptualizations are supported by several theories on technology, which are later applied to the theoretical-practical work in education in general. These are:

2.1 The Instrumental Theory, which constitutes the dominant view of the scientific-technological policies of modern governments and organizations since the last century; and the Substantive Theory, (Heidegger, M. y Ellul, J.)¹, which states that, the mere use of technology brings consequences for humanity and nature that go beyond the achievement of the technical objectives. The first considers technology as dependent on the values established in other spheres (political, cultural, etc.), while the second sees it as an autonomous cultural force capable of redefining all of the traditional values it competes with. Both lines are articulated into a Critical Theory of Technology, which is considered to preserve the best of both paving the way for a fundamental change in its comprehension. The Instrumental Theory offers the most accepted view today about technology. It is based on the common sense idea that technologies are “tools” that wait ready to serve the purposes of those who use them. Technology is considered “neutral”, without value in itself. However, what does the “neutrality” of technology really mean? This concept implies at least four ideas:

a. Technology, in terms of pure instrumentality, is indifferent to the variety of ends to which it may be used.

b. Technology, seems to be indifferent also to politics, at least in the modern world. A hammer is a hammer, an engine is an engine, and these tools are useful in any social context. The transfer of technology, on the contrary, is only limited by costs.

c. The socio-political neutrality of technology is generally attributed to its “rational” character and the universality of the transformations it embodies. Technology, in other words, is based on verifiable causal proposals, which makes it neither socially nor politically relative and which will work just as well as any other.

d. The universality of technology implies that the same standards of measure may be applied in different scenarios. Which is why it is a commonly held belief that technology increases productivity in different countries with different socio-cultural profiles, and that it is neutral because it is measured essentially by the same efficiency standards in all contexts.

2.2. The Substantive Theory, states that technology constitutes a new type of cultural system that restructures the whole social world into an

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¹ This distinction is taken from Albert Borgmann, Technology and the Character of Contemporary Life. Univ. of Chicago Press, Chicago, 1984
object of control\(^2\), through a mediating expansive dynamic that gives shape to everything in social life, with the aim of progress. Therefore, the Substantive Theory of technology tries to create awareness of the arbitrariness of this construction, or in other words, of its cultural character. We’re not saying that machines “dominate”, which is also perceived through social discipline-, but that in choosing to use technologies, we are making many other hidden cultural choices. Technology is not simply a mean, but a part of the physical and social environment with a way of life of substantive impact.

2.3. The “second derivative of technology” is a projection of the impact of technology, since it leads to a better understanding of the complementarity and impact of multiple factors, in the sense that any decision has consequences. Which can be analyzed through:

2.3.1. The personal and collective imbalance that technology establishes, and
2.3.2. Its lights and shadows.

The most spectacular case of a “second derivative” of technology is found in the example of the combustion engine that may change world climate. Who would have thought a century ago that the excess of automobiles around the planet, on a global scale, would have far greater negative effects than the positive ones. Effects which were duplicated when China entered the global economic game. Or that we may run out of oil in a few years time?

These are problems which may result in secondary negative effects, almost always unforeseeable, since our vision turns out to be “narrow and localist” in the concert of the world.

Another example is the toxicity that the planet will receive in the medium term, as something normal in everyday life. Another second derivative is spam, a derivative of e-mail. Who would have imagined that today the truly intelligent thing would be NOT to have e-mail, as the only effective antidote to spam? Or, who would have believed the false claim that we would spend less on paper once the digital era arrived?

2.4. This is why, the Critical Theory of Technology, proposes a path between resignation and utopia, by analyzing new forms of fragmentation and inequity associated to the technologism of the 21st century and states that there are new challenges such as the appropriation and redesign of technology, and now with greater boom, the ICT, to adapt to the needs of a freer and egalitarian society.

This new formulation of a Critical Theory of Technology is similar to the Substantive Theory in that it states that the technical order is more than the sum of tools and structures (or, in Heidegger´s words“frames”), the world in a more “autonomous” way. When choosing our technologies we become who we are because the present relationships and future choices are configured.

The act of choosing is already technologically saturated by the present culture, which cannot be seen as a free choice or which is made once and for all, because the type of culture changes and is guided by and for the consumption of “western “enjoyment”.

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That's why the Critical Theory rejects the instrumentalism and the fatalism of technology and recognizes the choice of the people and groups, for the modeling of the civilization that chooses the immanent flow of technology.

It rejects the neutrality of technology and affirms that the "technological rationality" should become a "communicative and political rationality (Habermas, J)". (Marcuse, 1964). (1), since technology represents social struggle or battle with the debate of civilization alternatives to be decided.

3. A historical epistemological tour to understand the discipline

The conceptualizations about technology thus arrive at education following a socio-cultural historical line and conforming diverse approaches for the studies and tasks of Educational Technology. Thus E.T. was conceived as a pedagogical discipline originated in the U.S.A at the middle of the 20th century, concerned with the application of social mass media and, today ICT in education, to improve the processes of education and learning. In the past two decades, due to the fact that this discipline has lacked clear and defined parameters for its conceptualization, a rigorous configuration of its field of study was prevented, which is why its work, developments, and achievements have been random and even contradictory.

This way, towards the 21st century there arrived a need, to organize a reconceptualization of the scope of study of this disciplinary area, from the new paradigms for understanding life, the world and the person, to a critical perspective of social sciences that includes education, culture, sciences and technology.

The search for new and comprehensive conceptual bases with contributions from different disciplines proposes an enormous socio-historical, cultural and formative discussion, regarding Educational Technology. We regard it as a special discipline of Technology that presents itself as an answer of intellectual evolution to the crisis represented by the technocratic and instrumental approaches, both behaviorist and linear in relation to education and teaching, its more prominent representatives being Bloom, Tyler, Kaufman, Gagné and Briggs, among others, in the middle of the 20th century. In the aim to make a brief socio-historical tour of the field during the 90’s and the beginning of the 21st century, E.T. starts to be defined as an attempt to reach a theoretical and methodological synthesis, carried out with rigor and not by a mere pragmatist eclecticism. This is due to the concern with reaching an intellectual maturity, as well as a socio-intellectual cohesion of shared coordinates regarding the practitioners of this technological subdiscipline, facing the theoretical conceptual disintegration that has characterized it for decades.

Diverse antecedents of consensus (CONTEC 2001, 2003, CEDIPROE: please see: www.cediproe.org.ar) have headed in this direction. Therefore, there is a debate within E.T. regarding its conceptualization and methodology, a very urgent requirement, today more than ever, in the Society of Information and Knowledge, if we’re trying to obtain something of use in this field. There is no doubt that the need will increase once it has proven its validity and pertinence in its articulation into specific educative projects as an integral part of the thought and actions of the protagonists (professors, designers, evaluators, etc.) who must be trained in this field.

The risk of E.T. is that it will become reduced to a rationalizing approach about the technological components of the teaching process, - nowadays, with the application of ICT in education as it was once with the social mass media, - considering them both as its object of study, in detriment to the “substantive” approach of technology, interdisciplinary, systemic-holistic, and critical socio-cultural that
rescues its genuine object of study through the educational technological mediations.

This way, among the critical revisions of E.T. that surpass its artefactual efficientist and standardized interpretation, which has characterized its conceptualizations and practices, there are diverse contributions, among these, those of Hawkridge, (1981) (1), Area Moreira (2004) (2), Fainholc (3). Thus, Hawkridge maintains that the educational technologists paid little attention to its conceptual and methodological problematic and this led to a serious absence of a coherent and shared founding framework by the community of practices that confirmed the proposals of the area.

There is therefore, the need to carry out a revision of its field (Hawkridge, 1981) (op. cit), (Fainholc, 2001) (op. cit) that considers the following moments:

1. The greatest expansion of E.T., with the appearance of associations, magazines and institutes, in the USA and England, occurs in the early 70’s where the ideas of Ely (1970) and Chadwick (1987) (4) appear with proposals and criticism referred to the substrate of the behaviorist psychology of Skinner, and offers a vision of the design and management of the educational processes related to industrial engineering. The existing division in the work in education between the professors and the technical designers is carried over; only what is manifest in human conduct as the goals of education is considered, and there is a belief in the rational and efficient control of the formative phenomena and processes, free of any option of values.

2. In the second half of the 70’s other opinions that question some of these principles and foundations of the behaviorist technocratic approach appear, although without offering a conceptual replacement on which to base the criticism, and that grants a new meaning to form a more comprehensive approach towards the area, in other words, that surpasses the empirical practices developed by those who are dedicated to the field without theoretical support, and that reviews the center of traditional education of prescriptive cut regarding the student. The goal is, therefore, to amplify the understanding of the field by resorting to the theory of systems, the communication sciences, philosophy and ethics, etc. to surpass educational designs of systematic and rational character, of “step by step” structuring and highly structured, to become systemic approaches and be more concerned with the processes than the products. All in all, these times represent a period of transition and progress. But although there is greater awareness of some limitations of how this is extended towards E.T., an alternative hasn’t been found yet, even more so if we are in the south of the world, where the indiscriminate and decontextualized transfers of technology, with "an applicationist" approach in education, were (and still are, above all in ICT) very much in force.

3. Towards the end of the 70’s and the beginning of the 80’s, there is the belief that there has been found a approach that surpasses the previous, as it resignifies potentialities of E.T. There is mention of the work of Gagne (1979) (5) among others, where he states that the model of information processing constitutes a new conceptual base of E.T. Although cognoscitivism enters the picture, this approach is not successful in developing an advance in the theoretical and conceptual nature to deepen E.T. as there are some technocratic characteristics within the field that survive (Moreira Area, 2004) (op. cit). These could be:

   a. The separation between the work of the designer of the project and the materials of E.T. (as pedagogical mediations) and its accomplishment/production on the part of the technical experts and its application on the part of the professor or facilitator. This has increased the alienating dissociation between the production of technological-educational knowledge and the teaching practices.
b. The educational process is conceived (and thus the risks with ICT are increased) in a unidirectional and massive industrial way (mainly when electronic learning (or e-learning) enters the picture) without recognizing the uncertainty that characterizes the practice of the actions and technological-educational processes.

c. The existing thought and pedagogical culture is hardly recognized in the teaching staff in decision-making with an active reconstruction of the educational programs as they are resignified by socio-cognition in order to understand reality, although there is much theory on the matter.

d. The socio-cultural approach of the field is hardly assumed, inscribed within the knowledge society (Fainholc, 2005) (6) to break not only the traditional molds that even today maintain that all education is mediated by and in the schools, not considering the alternative and continuous formative proposals (life-long learning) that are available today.

It is time to conduct a serious and re-comprehensive, conceptual and methodological consideration about the field of the special discipline of E.T., even more so facing the boom and the cross-sectional presence, development and impact that technology in general possesses when penetrating the whole socio-cultural reality and specially ICT, or Information and Communication Technologies, within the rapid economic, social, political and cultural change, of the globalized world begun in the advanced industrial countries and later distributed all over the world. We believe that Educational Technology is constituted in a research program (Lakatos, 1993) (7) identifiable in the world scientific-technological college community, as it articulates and agglutinates innumerable sciences and disciplines, which attempts to offer a comprehensive, deep, and coherent epistemological proposal, as an alternative to its traditional approach.

The same appear in the theoretical developments of epistemological frameworks of authors like Yeaman, Hlynka, Anderson, Damirin and Muffoletto, (1996) (8), among others, who deconstruct the traditional epistemological bases of E.T. as a technical-scientific rationality until it is reconceptualized and the analyses of the School of Frankfurt, the socio-cultural psychology of Vigotsky, the contributions on the power of Foucault, among the more prominent elements, are incorporated. This way, the works of Koetting (1983) (9), who analyzes the implications for E.T. of the three forms of knowledge: technical, practical and emancipatory, formulated by Habermas, 1972 (10), as well as the text of Hlynka and Yeamen (1992) (11), are the most mentioned by the followers of these deconstructive lines.

It is worthwhile to recognize that the magazine Educational Technology3 dedicated an issue to the reconceptualization of E.T. from the critical theory that has agglutinated a great number of the authors of this current, and it is also necessary to recognize the chapters included in the Handbook of Research for Educational Communications and Technology, coordinated in 1996 by Jonassen and started by AECT. The first, titled "Critical Theory and Educational Technology", signed by Nichols and Allen - Brown (1996) (12), and the other, referred to the contributions of postmodern thought, signed by Yeaman, Hlynka, Anderson, Damirin and Muffoletto (1996) (op. cit), all of whom were mentioned by Area, 2004 (op.cit), where along with my contributions and those of other specialists in the area, attempt to find an elaborated revision and critical proposal towards a conceptualization of the field of E.T.

It is also important to remember the contributions of Solomon (2000 to, b) (13) and Voithofer and Foley (2002) (14) regarding the identification of a possible agenda for a postmodern Educational Technology when considering the field of Cultural Studies and its projection in the study of the media and the need for literacy facing new cultural forms represented by ICT and Internet (Fainholc, 2004) (15). Within this, phenomena such as hypertextuality, open navigation, flexible

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sequences of access to data bases, the autonomous search for information on the part of the user, the personalization of the environments or interfaces of communication person-PC, virtual collaborative communities of learning, creative participation and open publication (web2.0) with content in Internet, etc. stand out. Consequently, curricular studies deserve a reconceptualization in light of the technological educational events that this field presents in the 21st century, recognizing the paradigms that sustain the goal of a linear thought and recognize that qualitative, alternative, and plural enrichments are needed, for the practice of readings /interaction/ deconstructive navigation, etc., as well as the establishment of a close and fertile relationship between science and art, and between the fictitious and nonfictitious forms of analysis and interpretation, or to emphasize the importance of practice over theory, considering that both are inseparable and articulable (T. Mc Cathy (1991) quoted in Nichols and Allen Brown (1996) (op cit) within socio-cultural frameworks that aim to overcome inequity and achieve social justice. It is also worthwhile to consider the contributions of the Spanish school of E.T. that searches for a revision of its field where Bartolome, 1989 (16); Area, 1991 (17); De Pablos, 1994 (18); Rodriguez Dieguez, 1995 (19); Cabero and Gisbert (2005) (20), Sancho (21), etc. are found.

4. Diverse contributions appropriated by the line of Critical or Rupturist Educational Technologists

It involves the critical articulation and the synthesizing integration of several conceptual and methodological lines, such as:

1- The paradigm of uncertainty according to Prigogyne and the fractals,
2- The recognition of the difference (for diversity) according to Deleuze,
3- The Science of practice and action of Ricouer and Luckman,
4- The deconstruction of Derrida,
5- The Analysis of speech of Foucault,
6- The Hermeneutics of Gadamer,
7- The interdependence pointed out by Bruner between the forms of representation through the senses and the formation of concepts,
8- The "Radar man " by Riesman (1962), the unidimensional man of Marcuse (1960), the “culture industry” of Horkeimer and Adorno, the development of communicative actions according to Habermas, etc within the framework of the critical analysis of the School of Frankfurt,
9- The model of orchestral communication of Bateson,
10- The notion of simulation of Baudrillard,
11- Mediations in learning, (cognoscitivism, constructivism and interactionism) according to Vigoski (1933), retaken by Bruner, Gardner; and in the Theory of communication by Serrano and Barbero,
12- The Situated Learning of Lave, and the Resistance/empowerment of Mc Lellan and Brown/Collins,
13- The critical theory of teaching, of comprehension and connectivism, according to Carr/Kemmis (1988), Perkins and Siemmens(2004),
14- Others.

5- Critical Educational Technology.
We have chosen this proposal to surpass the position of conventional Educational Technology. (Fainholc, B. revisits its field: please see www.cediprooe.org.ar) to define as the organization integrated by people, meanings, conceptualizations, simple devices (artisan and/or more complex and electronified equipment), pertinently adapted, that are used for the elaboration, implementation, and evaluation of educational programs and materials that aim for the promotion of the contextualized learning in a free and creative way (Fainholc, B. op.cit).

This definition of Appropriate Educational Technology, is different from and surpasses the conventional Educational Technology that mainly dealt with the use of audio-visual materials in the classroom. It is supported on the systemic-holistic approach, the socio-cognitive and constructive situated, interactive, connective and distributed for learning and teaching of comprehension psychology, and a sociology of social communication and the new information technologies within an alternative society (Fainholc, B. 2005) (22) of knowledge, which in turn attempts to offer a critical synthesis which will be mentioned ahead.

It therefore responds to the new paradigms that from a socio-cultural perspective proposes the need to select, combine and use technological mediations in a critical, contextualized and strategic way, according to the following criteria:

1- that strengthen the frames of communicative rationality, that is, participative, interactive and of confrontation, adapted to the specific needs of the users of educational projects.
2- that aim to reconstruct the contents, to review them and to modify them by the protagonism of each person who learns collaboratively in contrast in groups.
3- that form the link between theory – practice and practice - theory by investigation - action (search and recreation) of processes and products, to reach programs of intelligent, consistent and prospective development.
4- that structure mediated pedagogical situations and of production of didactic material for all the social mass media and ICT where connections and searches are encouraged so that the student learns in a conscious and contextualized way, to make decisions, solve, and anticipate individual and social problems in an ethical and supported way.
5- that lead us to know, adapt, combine, recreate, and criticize technological artifacts without being dazzled by their indiscriminate consumption, but establishing plans of incorporation and performance in terms of our own and authentic needs.

6. Educational Technology as a field and task in crisis and within a time of crisis.

6.1. Educational Technology at a time of crisis means there is a delay when it comes to making decisions that must be inscribed within a project of world and civilization (to be reflected in particular ways in the different countries) that must take into account the "Information Society" and contribute constructions for alternatives for the construction of "Knowledge Societies" within the society - network. Here the technology will be interface that will make access, acquisition and intelligent use possible - in spite of the still existing "the digital social gap" and that ties with the necessary and expected transformations of organizations and everyday socio-cultural relations.

This stage needs to stimulate the "Management of knowledge" in the most autonomous and supportive way possible in all the people and organizations, facing the overwhelming needs of a society technologized by ICT and electronic learning. The management of knowledge is defined by the potential value of the capacity to generate, in future, in a sustainable way, new processes, products and services...
through the combination of competencies of qualified people, intelligent processes and tools that aim for the development of intellectual (or socio-cognitive) capital that makes organizations more and more productive, innovative and competitive. Although today technology is essential to achieve this, as the instrumental theory still prevails, it will be necessary to fight to overcome this.

6.2. The field of Educational Technology is also in crisis, which means that it must be conceptualized and considered inscribed in a cultural and historical frame within the paradigm of chance and uncertainty. It is all about the existence of indetermination, of phenomena that are random, fractal, of dissipative structure, that do not occur in by themselves, but within extremely self-organized systems although they seem chaotic. It is about the characteristics of the new interpretive paradigms of the world, life and people according to Prigogyné, I. among other theoreticians where the exposed is the opposite of certainty and that all of it must saturate the area of education.

The crisis of Educational Technology deserves to be discussed inwards of its field as special a technological discipline - as defined before. It means that once the stage of conventional Educational Technology was surpassed, whose pillars was the use of audiovisual aids in schools or in education, with its first crises in the 80’s with the appearance of the movement of Appropriate Technology, Technology is developed throughout the 20th century and becomes a discipline, that takes care of artificial objects (Simon, H.1969) (23) with its own methods (that is, the design of projects and the analysis of technological products). In order to reach, in this way, education as well as other areas of knowledge.

Nevertheless, as the epistemological supports of the disciplines are not tame waters and for this reason it is maintained "that it is in crisis", in this field even more so because we are at the beginning of the recognition of this area of knowledge.

The crisis of Educational Technology is even more stressed in the south of the world and in contexts of migratory and nomad poverty, thus requiring that it be "appropriate", socially grounded and culturally adapted in pedagogical mediations according to scenarios and actors. In these contexts we must select and combine as much traditional technology as the sophisticated or electronified one, in other words, to use all the processes and supports of the area called "Mediatic".

Therefore, technology must be "appropriate" and "critical" by the necessity that the remainder of its interactions must be of coherent impact to its users and realities, through pertinent pedagogical, semiological, cognitive, emotional, and socio-cultural designs, aimed towards developing higher thought functions with reflective or critical reasoning.

This way, we define *Appropriate and Critical Educational Technology* as the field of the special educational technological knowledge, an open space and of reflection for investigation and contrast of the educational practices mediated in educational projects and materials (curricular, if we're dealing with formal education) today more and more articulated with ICT.

It is a special technological discipline whose object of study is the mediated educational technological actions, that act as historical - cultural – semiological - didactic environments and tools in diverse supports, cause diverse domains in the structuring and socio-cognitive functions in the person who learns in a situated and distributed way, and which are inscribed in the practices of formal and nonformal, face-to-face and distance teaching. Its disciplinary object is the pedagogical mediation.

Among its more prominent foundations we can name:
1- Practical pedagogy of communicative, reconstructive and critical ethics, of respect for a multi and interculturalist diversity, for a supported coexistence.
2- Appropriation of technological resources on human scale promoting equity, egalitarian participation and personal and collective self-control.
3- Resignification uncertainty to overcome diverse fragmentation and extending reflection and lucidity together with other forms of practical theoretical thought.
4- Epistemological demystification in interactive and interconnective navigation to strengthen critical reading and comprehension, in hermeneutic proposals.
5- Construction of the "global telematics" through significant and valuable mediations/ negotiations for the socio-cognitive development in day-to-day practice.
6- Development of the autonomous moral and the rational and mature self-regulation in metatechnical educational contexts.

Educational Technology, nevertheless, in these last decades, has not generated a sufficiently coherent and explanatory knowledge of the set of cultural and scholastic phenomena that are intimately tied with the technological, nor has the knowledge available been assumed and put in practice on the part of the educational professionals. We can affirm that to date the knowledge which we have produced on means and technologies in education is excessively fragmented and has been of little use to generate processes of improvement and continuous and sustained educative change.

This has been due, among other reasons, to the fact that the structure of epistemological hegemonic rationality in Educational Technology has been of a technical-rationalist nature, avoiding or turning its back to the more socio-critical, cultural and political postmodern perspectives for the analysis of the relations between technologies and education. It is urgent and necessary to change this approach and this form of thought because times are changing and problems do not wait.

The transformations that are taking place in the western world caused by the transition of an industrial society to one of a postindustrial nature, trigger the appearance of new educative problems which have a very close link to concepts and terms that are very well-known in our field and to which traditionally our discipline has paid attention: the technological, the mediatic, the audio-visual, communication, distance education... I am referring to problems like technological illiteracy, the inequalities in the access to culture and digital technology, the new patterns of consumption of mediatic products and communicational habits (Fainholc. B 2005) (op.cit) on the part of children and young people, the continuous training of workers, the gap between the traditional systems and formative models. (Area, 2001) (op.cit). We are, thus, before a different socio-political, cultural and educative context, that logically requires the identification and formulation of the new educative problems. But to achieve this it needs frameworks or platforms, not technological but epistemological, and well differentiated perspectives from the theoretical tradition used by Educational Technology in the preceding decades.

The aim is to revisit and redefine the relationship between Technology and Education in the new digital century and of mediatic hegemonic relevance to outline theoretical foundations, but more comprehensive than the conventional ones, in other words, systemic-holistic articulating the contribution of varied social sciences, interested in the socio-cultural production that affects the formative processes. These bases will become the frameworks or platforms, along the lines of a "critical theory of the technological scientific knowledge" that reconsiders the paradoxical characteristics that the production of knowledge presents in the context
of the 21st century. Where, in turn, ICT possess every day greater boom with all the electronic distance educational modalities, pure and/or combined.

This way, a conception or paradigm of Educational Technology approaches us, that leaves behind and tries to surpass the technical-instrumental – rational bases that were its foundation throughout the 20th century. The goal is to adopt a conceptual identity derived from an interdisciplinary concert of theories of social sciences more than of engineering and systems, to thicken, within the framework of postmodern theories, what could be called, an "Appropriate and Critical Educational Technology" for the production of technological knowledge.

Technology is thus defined, surpassing the efficientist obsession with the instrumentalized in general and in education, to articulate it to the ideological values, cultural objects, social contexts of use, etc. to understand education as socio-political and cultural phenomenon (Escudero, 2001; Hlynka, 1995) (3) (quoted by Area).

This Appropriate and Critical E.T. tries to disclose or disassemble the hegemonic interests of homogenizing cultures, of a highly structured instructional design, in the search for effectiveness in the achievement of objectives, the measurement of the results in the yield of learning, the quantification of the educational variables, etc.

On the contrary, A. and C. E.T. is concerned with issues and problems related to the epistemological, sociological, anthropological perspectives of culture. In order to consider the analysis of the components in the design, production, distribution, consumption of mediatic products and how they affect different social groups (youngsters, ethnic groups, women, immigrants, etc.) in order to identify and to reconstruct the hidden ideological messages and interests, as well as the values concealed within the mediations and messages in general, among other many topics, would be some of the areas of interest of an Appropriate and Critical Educational Technology.

In this way, a coherent and alternative epistemological proposal is offered to the classic approaches of the Critical Educational Technology, which have been in force for many decades (and are still very much in use with ICT) and are based on the positivist rationality of science and knowledge, as one may suppose, is not an easy task nor free of risks.

In conclusion, it should continue finding support in the great principles of informed modernity (equality, democracy, rational knowledge, rights to free speech among people in equity fairness and social justice, among others), but assuming the new phenomena and characteristics of the technologized of the 21st century in the search to recognize and accept the diversity, recognize the intersubjective interaction – face-to-face and distance- in the construction of subjectivity, individuality, ethical pluralism, rizomatic and uncertain fractals, etc.)

There are more elaborated proposals and theoretical developments of an alternative epistemological framework to the linear conventional bases of E.T., with other theoreticians like Muffoleto, Solomon, Nichols, Yeaman, among others, that articulate rich ideas within the socio-cultural approach (of Vigotsky, Wertch and others).

For this reason (Escudero, 1995) (5) this revisionism is "aimed at reinterpreting Educational Technology from a perhaps an explosive mixture, but without a doubt rupturistic of critical theory, post- structuralism, feminist theory, literature and semiotic, theory of culture, anthropology and philosophy... (it is) an alternative
project that pursues, searches for, in sum, to develop the human side of
technology, to adopt a perspective that incorporates in its analysis and use moral
criteria and values impossible to renounce in a democratic society, such as equity
fairness and social justice, personal and collective emancipation.

Another interesting and serious contribution to Critical Technology is given by Area
(1993) (24), who questions the technocratic vision of E.T. or "educational
engineering", and (Area and others, 1995) when trying to reconceptualize the
discipline in question finding support on the bases of a critical theory. Also, the
works of the Cultural Studies of the school of Buckingham (2002) (24), as well as
recently, Burbulles and Callister (2001) (25), among others, support the
aforementioned.

7- A logical evolution and search for the necessary maturity.

It would really be necessary to mention many debates in search for diverse
consensus (CEDIPROE, CONTEC 2003, 2004, 2005) to trace a boundary and enrich
the discussion and the articulated convergence of disciplines of interest for an
Educational Technology of relevance and academic significance and practice. It also
involves a logical evolution and of necessary maturity to the interior of its field that
tries to surpass its first preoccupation with media as apparatuses, which later
changed to an interest in media as supports of communication and their symbolic
languages to represent information. It later became of to know the cognitive impact
of the same, and now to deepen the educational technological mediations in their
diverse dimensions of analysis to surpass a fragmented vision of the media, the
mediators and the mediations in a situated and distributed way.

In order to obtain an integrating and critical perspective with production of
knowledge in an articulated and ample way formative values and aims must be
included. In addition to endless of areas of social knowledge (Psychology of
learning, constructivist Philosophy and socio-cultural approach; Sociology, in
general and of Culture; the Theory of Social Communication; the Information
theory; the Cultural Studies, Didactics and theory of curriculum, Semiology, etc.) in
order to stimulate socio-political, ethical and technological interdisciplinary
reflection of the educational processes and products facing the enormous changes
in the 21st century.

ICT or new technologies have a special relevance in education and culture with their
mercantile characteristics and risks and of cultural discipline, which are manifested
in "manufactured products" industrially elaborated in distance education with the
courses on line or of e-learning, including universities and virtual campuses.

To conclude: as it is perceived, it is not so simple to trace boundaries between
fields and to practice criticism in order to examine situations of crisis like the
current situation for Educational Technology, fields that are still changing.

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