
Educational Technology in Crisis

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ABSTRACT The presentation of the historical epistemological path is needed to understand and reconsider the discipline of Educational Technology in articulation to contributions of rupturist theorists in order to reach to a critical proposal and a revision of its field. This field is facing a deep crisis within a time of world crisis, specially in the southern hemisphere and in contexts of migration of nomad or poor users. 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 with virtual ones to be delivered in an electronic formats. Appropriate and Critical Technology is a special technological discipline and a knowledge field where we cultivate open and reflexive special knowledge, towards research and contrast at 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.

Introduction

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, by different theories of technology that have reached education in general and today, education mediated by information and communications technology (ICT) in distance and e-learning modes, as well as other associated electronic manifestations of the educational phenomenon.

These conceptualizations are supported by several *theories on technology*, which are later applied to the theoretical-practical work in education in general. These are as follows.

The *Instrumental Theory* constitutes the dominant view of the scientific-technological policies of modern governments and organizations since the twentieth century, and the *Substantive Theory* (Heidegger & Ellul)[1], states that the mere use of technology brings consequences for humanity and nature that go beyond the achievement of the technical objectives. The Instrumental Theory considers technology as dependent on the values established in other spheres (political, cultural, etc.), while the Substantive Theory sees it as an autonomous cultural force capable of redefining all of the traditional values it competes with. Both arguments 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:

1. Technology, in terms of *pure instrumentality*, is indifferent to the variety of ends to which it may be used.
2. 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.
3. 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 make it neither socially nor politically relative and which will work just as well as any other.
4. 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 sociocultural profiles, and that it is neutral because it is measured essentially by the same efficiency standards in all contexts.

The *Substantive Theory* states that technology constitutes a new type of cultural system that restructures the whole social world into an 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. That is not to say 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 means, but a part of the physical and social environment with a way of life of substantive impact.

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 the personal and collective imbalance that technology establishes, and its lights and shadows. The most spectacular case of a 'second derivative' of technology is found in the example of the combustion engine, which 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 positive ones; effects which were multiplied 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 email. Who would have imagined that today the truly intelligent thing would be *not* to have email, 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?

This is why the Critical Theory of Technology proposes a path between resignation and utopia, by analyzing new forms of fragmentation and inequity associated with the technologism of the twenty-first century, and states that there are new challenges such as the appropriation and redesign of technology, and now the greater boom of 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'), points out 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, and 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'. That is 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, 1972; Marcuse, 1964), since technology represents social struggle or battle with the debate of civilizational alternatives to be decided.

A Historical Epistemological Tour to Understand the Discipline

The conceptualizations about technology thus arrive at education following a sociocultural historical line and merging diverse approaches for the studies and tasks of Educational Technology. Thus, Educational Technology was conceived as a pedagogical discipline which originated in the USA in the middle of the twentieth 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.

Thus, at the middle of the twenty-first 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. It is regarded as a special discipline of technology that presents itself as answering 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 twentieth century. In the aim to make a brief socio-historical tour of the field during the 1990s and the beginning of the twenty-first century, Educational Technology 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 [see: <http://www.cedipro.org.ar>]) have headed in this direction. Therefore, there is a debate within Educational Technology regarding its conceptualization and methodology, a very urgent requirement, today more than ever, in the information and knowledge society, if we are 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 for Educational Technology 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 sociocultural, that rescues its *genuine object of study* through the *educational technological mediations*.

This way, among the critical revisions of Educational Technology that surpass its artefactual, efficientist and standardized interpretation, which has characterized its conceptualizations and practices, there are diverse contributions, among these, those of Hawkrigde (1981), Area Moreira (2004), and Fainholc (2001). Thus, Hawkrigde 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 communities of practice that confirmed the proposals for the area.

There is, therefore, the need to carry out a revision of the field of educational technology (Hawkridge, 1981; Fainholc, 2001) that considers the following moments:

1. The greatest expansion of Educational Technology, with the appearance of associations, magazines and institutes, in the USA and the United Kingdom, occurs in the early 1970s, when the ideas of Ely (1970) and Chadwick (1987) appear with proposals and criticism referred to the substrate of the behaviorist psychology of Skinner, and offer 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 1970s 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, like practitioners, to the field without theoretical support. 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 Educational Technology, an alternative has not been found yet, even more so if we are in the southern hemisphere, 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 1970s and the beginning of the 1980s, there is the belief that an approach has been found that surpasses the previous, as it resignifies potentialities of Educational Technology. There is mention of the work of Gagné (1979) among others, where he states that the model of information processing constitutes a new conceptual base of Educational Technology. Although cognoscitivism enters the picture, this approach is not successful in developing an advance in the theoretical and conceptual nature that would deepen Educational Technology as there are some technocratic characteristics within the field that survive (Area Moreira, 2004). These could be:
 - (a) The separation between the work of the designer of the project and the materials of Educational Technology (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 programmes as they are resignified by socio-cognition in order to understand reality, although there is much theory on the matter.
 - (d) The sociocultural approach of the field is hardly assumed, inscribed within the knowledge society (Fainholc, 2005a, b) to break not only the traditional moulds that even today maintain that all education is mediated by and in the schools, not considering the alternative and continuous formative proposals (lifelong learning) that are available today.

It is time to conduct a *serious and re-comprehensive*, conceptual and methodological consideration of the field of the special discipline of Educational Technology, even more so facing the rapid development and the cross-sectional presence, development and impact that technology in general

possesses when penetrating the whole sociocultural reality and especially ICT, 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. Educational Technology is constituted in a *research programme* (Lakatos, 1993) 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.

These same comprehensive and alternative ideas appear in the theoretical developments of epistemological frameworks of authors like Yeaman et al (1996), among others, who deconstruct the traditional epistemological bases of Educational Technology as a technical-scientific rationality until it is reconceptualised, and the analyses of the School of Frankfurt, the sociocultural psychology of Vygotsky, and the contributions on the power of Foucault, among the more prominent elements, are incorporated. This way, the works of Koetting (1983), who analyzes the implications for Educational Technology of the three forms of knowledge: technical, practical and emancipatory, formulated by Habermas (1972), as well as the text of Hlynka & Yeaman (1992), are the most mentioned by the followers of these deconstructive lines.

It is worthwhile recognizing that the journal *Educational Technology* [3] dedicated an issue to the reconceptualization of Educational Technology from the critical theory that has agglutinated brought together 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 initiated by AECT (Association for Educational Communications and Technology, <http://www.aect.org>). The first chapter, titled 'Critical Theory and Educational Technology', by Nichols & Allen-Brown (1996), and the other chapters, referred to the contributions of postmodern thought by Yeaman et al (1996), all of whom were mentioned by Area Moreira (2004) which, 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 Educational Technology.

It is also important to remember the contributions of Solomon (2000a, b) and Voithofer & Foley (2002) 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 the Internet (Fainholc, 2004a). Within this, phenomena such as hypertextuality, open navigation, flexible sequences of access to databases, the autonomous search for information on the part of the user, the personalization of the environments or interfaces of communication between person and PC, virtual collaborative communities of learning, creative participation and open publication (Web 2.0) of content on the internet, etc. stand out. Consequently, curricular studies deserve a reconceptualization in light of the technological educational events that this field presents in the twenty-first century, recognizing the paradigms that sustain the goal of a linear thought and recognizing 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 non-fictitious forms of analysis and interpretation, or to emphasize the importance of practice over theory, considering that both are inseparable and articulable (Mc Cathy [1991] quoted in Nichols & Allen Brown, 1996) within sociocultural frameworks that aim to overcome inequity and achieve social justice. It is also worthwhile to consider the contributions of the Spanish school of Educational Technology, which searches for a revision of its field, where Bartolomé, (1999), Area (1991), De Pablos (1994), Rodriguez Dieguez (1995), Cabero & Gisbert (2005), Sancho (1996), etc. are found.

Diverse Contributions Appropriated by Critical or Disruptive Educational Technologists

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

1. uncertainty and factals according to Prigogyne;
2. Deleuze speaks about the difference;
3. the science of practice and action of Ricoeur 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 (1964), the 'culture industry' of Horkheimer 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 Vygotsky (1933), retaken by Bruner, Gardner; and in the Theory of Communication by Serrano & Barbero;
12. the situated learning of Lave, and the resistance/empowerment of McLellan and Brown & Collins;
13. the critical theory of teaching, of comprehension and connectivism, according to Carr & Kemmis (1988), and Perkins & Blythe (1994) and Siemens (2004),

Critical Educational Technology

The proposal of Applied Educational Technology surpasses the position of conventional Educational Technology (Fainholc revisits its field: see <http://www.cedipro.org.ar>). It is maintained and points out the organization integrated by people, meanings, conceptualizations, simple devices (artisan and/or more complex and electronic equipment), pertinently adapted, that are used for the elaboration, implementation, and evaluation of educational programmes and materials that aim for the promotion of contextualized learning in a free and creative way (B. Fainholc, <http://www.cedipro.org.ar/Publications>).

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 of knowledge (Fainholc, 2004, 2005), which in turn attempts to offer a critical synthesis which will be mentioned below.

It therefore responds to the new paradigms that from a sociocultural perspective propose 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 re-creation) of processes and products, to reach programmes of intelligent, consistent and prospective development;
4. that structure mediated pedagogical situations and 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 artefacts without being dazzled by their indiscriminate consumption, but establishing plans of incorporation and performance in terms of our own and authentic needs.

Educational Technology as a Field and Task in Crisis and within a Time of Crisis

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 the interface that will make access, acquisition and intelligent use possible – in spite of the still existing 'digital social gap' – and that ties with the necessary and expected transformations of organizations and everyday sociocultural relations.

This stage needs to stimulate the 'management of knowledge' in the most autonomous and supportive way possible in all people and organizations, who are 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, and 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.

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 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 Prigogine, among other theoreticians, where the exposed is the opposite of certainty and all of it must saturate the area of education.

The crisis of Educational Technology deserves to be discussed within its field as a *special technological discipline* – as defined before. It means that once the stage of conventional Educational Technology was surpassed, whose pillars were the use of audio-visual aids in schools or in education, with its first crises in the 1980s with the appearance of the movement of Appropriate Technology, Technology is developed throughout the twentieth century and becomes a discipline that takes care of artificial objects (Simon, 1969) with its own methods (that is, the design of projects and the analysis of technological products). In order to, in this way, build the field of education sciences as well as other areas of knowledge.

Nevertheless, as the epistemological supports of the disciplines are not quiet water 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 the 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 electronic. Variety; in other words, use all the processes and supports of the area mediated by ICT.

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 sociocultural 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 of reflection for investigation and contrast of the educational practices mediated in educational projects and materials (curricular, if we are 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 non-formal, face-to-face and distance teaching. Its disciplinary object is pedagogical mediation.

Among its more prominent foundations we can name:

1. practical pedagogy of communicative, reconstructive and critical ethics, of respect for a multiculturalist and interculturalist diversity, for a supported coexistence;
2. appropriation of technological resources on a human scale, promoting equity, egalitarian participation and personal and collective self-control;
3. resignification of 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 socio-cognitive development in day-to-day practice;
6. development of the autonomous moral and the rational and mature self-regulation in meta-technical educational contexts.

Educational Technology, nevertheless, in recent decades, *has not generated a sufficiently coherent and explanatory knowledge* of the set of cultural and scholastic phenomena that are intimately tied in with the technological, nor has the knowledge available been assumed and put into 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 on 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 post-industrial 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 mediated by ICT, the audio-visual, communication, distance education. I am referring to problems like technological illiteracy, inequalities in access to culture and digital technology, the new patterns of consumption of products mediated by ICT, and communication habits (Fainholc, 2005b) on the part of children and young people, the continuous training of workers, the gap between the traditional systems and formative models (Area, 2001). 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 preceding decades.

The aim is to revisit and redefine the relationship between Technology and Education in the new digital century and of mediated by ICT 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 sociocultural 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 twenty-first century; where, in turn, ICT possesses every day greater importance 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 twentieth 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 a socio-political and cultural phenomenon (Hlynka, 1995; Escudero, 2001)(quoted by Area).

This Appropriate and Critical Educational Technology 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, Appropriate and Critical Educational Technology is concerned with issues and problems related to the epistemological, sociological and anthropological perspectives of culture. The analysis of the components in the design, production, distribution, consumption of mediated 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 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, it is not an easy task or 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 technologies of the twenty-first century in the search to recognize and accept the diversity, the intersubjective interaction – face-to-face and distance – in the construction of subjectivity, individuality, ethical pluralism, rhizomatic and uncertain fractals, etc.

There are more elaborated proposals and theoretical developments of an alternative epistemological framework to the linear conventional bases of Educational Technology, with other theoreticians like Muffoletto, Solomon, Nichols, Yeaman, among others, that articulate rich ideas within the sociocultural approach (of Vygotsky, Wertsch and others). For this reason (Escudero, 1995) this revisionism is:

aimed at reinterpreting Educational Technology from a perhaps an explosive mixture, but without a doubt disruptive of critical theory, post-structuralism, feminist theory, literature and semiotics, theory of culture, anthropology and philosophy ... [it is] an alternative project that pursues, searches for, in sum, uses the human side of technology, to adopt a perspective that incorporates in its analysis and develops 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) who questions the technocratic vision of Educational Technology or 'educational engineering', and when trying to reconceptualize the discipline in question finds support on the bases of a critical theory (Area and others, 1995). Also, the works of the Cultural Studies School by Buckingham (2002), as well as recently, Burbulles & Callister (2001), among others, support the aforementioned work.

A Logical Evolution and Search for the Necessary Maturity

It would really be necessary to mention many debates in the search for diverse consensus (CONTEC: Consensus of Educational Technology, by CEDIPROE Foundation [see <http://www.cediprooe.org.ar>], various dates) 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 a 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 necessary to know the cognitive impact of the different symbolic languages, and now to deepen the educational technological mediations in their diverse

dimensions of analysis to replace 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 the production of knowledge in an articulated and ample way, formative values and aims must be included. In addition, we have to take into account areas of social knowledge (psychology of learning, constructivist philosophy and the sociocultural approach; sociology, in general and of culture; the theory of social communication; information theory; 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 twenty-first 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 online courses or 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 practise criticism in order to examine situations of crisis like the current situation for Educational Technology, fields that are still changing.

Notes

[1] This distinction is taken from Borgmann, 1984.

[2] For the revision of this tendency please see Wiener, 1977.

[3] *Educational Technology*, 34(2), 1994.

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