Interlocutions of researches in technologies in education[1]*

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Abstract

This study is aimed to discuss about the senses and meanings of technologies in education, converging to new forms of pedagogical actions and reflection on the changes caused in the understanding of the teaching and learning processes with the technological interfaces. With such purpose, we carried out a mapping, in the Brazilian Digital Library of Thesis and Dissertations (BDTD), of thesis produced in the Post Graduation Programs in Education from Brazilian public universities in the 2012-2014 triennium. In order to forge these schemes, we considered the acknowledged bibliographical production on technologies in education articulated to the debates of the critical scholars, in a perspective of the reconstructive hermeneutics. In the face of a trend to end borders and the exchange of relationships with the world, which strategies do the theses in the educational field justify to overcome the appeals for the domain of technical skills and foster intercultural and educational dialogues in the era of technological innovations? The ambiguities found in the investigation are the result of several approaches concerning the technologies and their languages, practices and policies, bringing perplexities and uncertainties in the world between virtuality and pedagogical reality, and taking the risk of falling again into sterility of the debate. The mapping carried out in the present work assumes some relevance, especially, to carry out the challenge of understanding the senses and meanings of the technologies in education to go beyond the descriptive view of success of some practices.

Keywords

Technologies – Education – Researches – Interculturality.

Initial Considerations

The interrelationships between culture, technology and education highlight as a challenge the experience of living one with others, in a time of rapid advances in the field of technologies and wide access to information sharing networks. Because of

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this, "convergence is a Word that can define the technological, commercial, cultural and social transformations, depending on who is talking and what they imagine to be talking about" (JENKINS, 2009, p. 29). We know that the technologies are not only a mean of dissemination of information, because, as we lack this support, we also modify our understanding of the world and the way we interact, communicate and learn.

This study aims to discuss about the senses and meanings of the technologies in education, converging to new forms of actions and reflection on the changes caused in the understanding of the teaching and learning processes with the technological interfaces, in the face of the risks and the instability of the signs which guide the pedagogical practices. With such intent, we carried out a mapping, in the Brazilian Digital Library of Thesis and Dissertations (BDTD), of thesis produced in the Post Graduation Programs in Education from Brazilian public universities in the 2012-2014 triennium, trying to identify converging elements for a discursive configuration about the technologies in education. In order to forge these schemes, we considered the acknowledged bibliographical production on technologies in education articulated to the debates of the critical scholars, in a perspective of the reconstructive hermeneutics (HABERMAS, 1987).

According to Lévy (1996), from the information and communication technologies (ICT) unusual knowledge devices, social representations, original assessment criteria to guide the knowledge, new actors in the production and treatment of knowledge arise. For the field of education, these innovations require further development in the researches, in order to promote uplifting dialogues, especially about the senses and meanings that these transformations foster sociocultural and economic dynamic, in teaching practices and policies, in the processes of cultural connection and in the production of learning.

Thinking about the technologies in education implies considering the de-centered learning in the era of access (or its suppression), which is manifested in a series of languages which intermingle in the *ubiquity of the hybrid technologies of social life* (SANTAELLA, 2003). After all, every technological gadget creates a language, a world perspective, a way of life, which means that it is a political action in its deepest meaning sense. The monologic and one-way structures of communication no longer support the radical and open transformations of the processes of construction of knowledge in exchanges, transition and sharing in global and interactive network. In the face of a trend to end borders and the exchange of relationships with the world, which strategies do the works in the educational make use of to overcome the appeals for the domain of technical skills and foster intercultural and educational dialogues in the era of technological innovations?

In the spring of 2006, Habermas received the award Bruno Kreisky for promoting the human rights. According to Santaella (2010), Habermas, when thanking for the award, presented an analysis concerning the new media and the public intellectual life, affirming that the contribution of the scholars, in on-line environments lose the power of creating a focus. To defend the internet, Santaella (2010) presents Dányi's discourse, which says that the internet is a more advanced stage of the media evolution, consisting of an opportunity for the rethinking the applicability and the usage of

traditional categories such as audience, content producers, public etc. The use of virtual networks for sharing experiences resulted, according to Santaella, in a depreciation of the physical public space, in favor of one own public sphere of the globalized networks.

We recall that the insurgency of critical scholars, such as Horkheimer (1985), against the primacy of the method and the technique, which expanded the rationalization of procedures and the human reification (depolitization of the masses by the cultural industry) was a way to combat the passiveness brought by the technical apparatus, which conditions the subjects to a naïve consumerism in the immediate life sphere. Another way to create a non-passive coexistence before the technological innovations is to consider that these transformations result in tensions, contradictions, resistances and anxieties, resulting in conditions for the understanding and the creation of other forms of interactive action. These configurations represent the challenges of the pedagogical processes in the contemporary world. Thus, the present work firstly discusses the construction in the field of technologies in education, taking into consideration the mapping of thesis produced in the last triennium. After this, the main discussions which were highlighted in these researches are analyzed, considering the interpretative possibilities that the discursive convergences allow. Finally, we indicate some tensions and perspectives that the field of technologies in education fosters in the contemporary world.

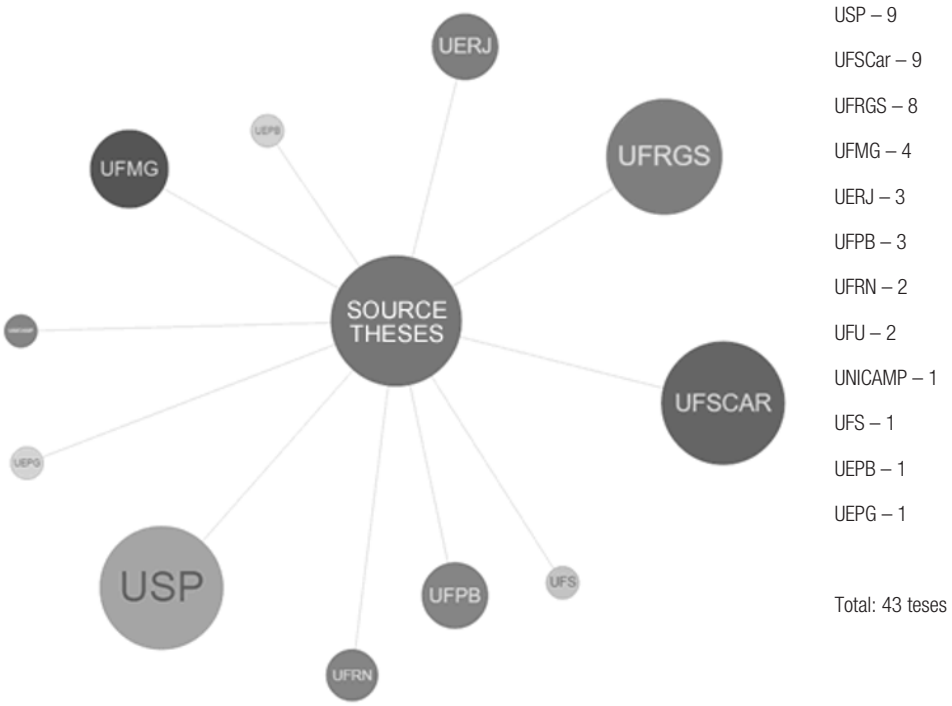
The establishment of the studies on technologies in education

Contextualizing the paths of the TIE in education, we identify that, historically, the pedagogical practice tries to be translated into a transmissive and interventionist action, in terms of reading, writing, research techniques, passing through the virtual digital technologies. In general terms, the technologies as well as the methodological approaches provide and final and one-way attitude, focusing on the challenges and the conformation with the urgencies, which obey the heuristic resources and the immediate results. The Brazilian technologies in education arose from the functionality and domain of computing apparatuses, with an institutionalized and objectivist language. For this reason, the use of technology started to rule the training process without taking into consideration the logic of human development, which consists in providing to another person and an opportunity and foster the epistemological curiosity instigated by the different sensorial discourses and modes (HERMANN, 2002; MATOS, 2013; BARROS; 2014).

Besides this operational-technical view, the technologies have an intrinsic educational role in the cultural context of the society as they promote the global communication of information and knowledge, the encounter with the differences, processes in articulation with the historical knowledge in production, flow, use and reconstruction of ideas and interpersonal practices, destabilizing hierarchies and vertical relationships of cultural transmission. The pedagogical dialogue is, or should be, a process against alienation and the uniformity of knowledge, as it connects to another person, to the world, to nature and the society and it preserves the holistic bases of real life as a principle of knowledge and the humanization of the relationships through critical cooperation.

The complex network of information which is connect and is unfold along the training and the pedagogical daily practice presents challenges for the reading of the educational technologies and the creative work. We took as a foundation for the *corpus* of the analysis, all the thesis produced in the triennium 2012-2014, in Post Graduation programs in Education from public institutions and found in the BDTD website, using the key words: technology, education and their variations. Based on this search and on the reading of the abstracts, we selected 43 theses on technologies in education. It is worth highlighting that we did not rank the thesis according to the teaching levels and modes, as what mattered to us was the convergence, the incidence, the reach and the concern about the use of the technologies in all educational systems of the country. The table below (Figure 1) shows the location of the thesis selected at different universities.

Figure 1 – Conceptual outline of the corpus analyticus (Theses produced from 2012 to 2014)



Source: elaboration of the authors.

From the reversals provided by a hermeneutic approach[3], we understand that the forecast of researches in the field of the technologies in education does not form manipulative truths or duress of the administration. Unlike, the updating of the debates depends, to a large extent, on the attention of the researchers in seek the tension between the technological innovations and their contributions for the reach of the objectives of

education. Because of this, the figures we elaborated are not intended to closure the thesis in fixed categories of analysis, but they express an effort to converge common voices and learn to dialogue with the contradictory. As we understand a reality which belongs to us and indicate the students' productions of the technological knowledge in the field of education, we clarify, via the BDTD website, the tessitura of the analysis carried out using the abstracts of the referred collected thesis and reinterpreted by the dialogue with the hermeneutic practice. Due to the ambiguities, representations, similarities, styles and theoretical-methodological hybridism of these studies, the 43 thesis were grouped according to the similarity of themes and interests highlighted in their abstracts, as it is shown in the Figure 2 (below).

Figure 2 – Outline of theses approaches / Map of studies

A. Training policies of the Federal Institutes and the teaching in Professional and technological education (14 theses)

B. Teaching and learning processes and the technologies in the interdisciplinary perspective (6 theses)

C. Experiences with distance teaching and the teaching work at UAB (5 theses)

D. Initiatives with the new technologies (4 theses)

E. The use of social networks in educational projects (4 theses)

F. Legitimation discourses on distance teaching (3 theses)

G. Dialectic interactions with the technological contents (2 theses)

H. Teaching conceptions on digital technologies (2 theses)

I. Analysis about the PROUCA project (2 theses)

J. Criticisms to the commercialization of technological knowledge (1 thesis)

Source: elaboration of the authors.

For the fulfillment of a more hermeneutic[4] tessitura of these productions, the outline of approaches of the Figure 2 was categorized in three circularities: a) training policies of the Federal Institutes and professors' conceptions; b) pedagogical practices and

4- The several texts and talks that converge to the hermeneutic circularity of this study bring with them the experience of shock, strangeness (with the texts/discourses) and the ambiguity to meet the technological situations (of different senses, dynamic and uses of communication in the educational processes). Such ambiguities are inherent to the hermeneutic effort (of seeking the understanding and interpretative sense of the human formation), able to avoid the dangers of dogmatism or of one-way design of technical, instrumental or technocratic learning, towards a critical and reflexive potential of world with the historical conditions of the work (in a battlefield of ideas). For Habermas (1987), the collective learning processes which arise from inter-subjective dimensions, need to problematize the issues of their time, which means understanding the cultural and technological knowledge generated by the discursive freedom (emancipatory project of a complex and learning rationality), and by the

democratization of the access to ICT; and c) legitimization of the discourses on ICT and Distance Teaching. These identified fields for the theoretical treatment of the complexity of the educational problems, besides revealing provocations with the different investigative experiences, provide possibilities for dialogue and review in other contexts, taking the unique power of these theses, reinterpreted in the light of the sociocultural conditions.

Training policies of the Federal Institutes and professors' conceptions

The productions that form this group arise from the approaches A and H of Figure 2 and converge as they focus on the concern about the training carried out by the Federal Institutes of professional, scientific and technological education, considering the specific characteristics of teaching and the profile of the teachers in the technical professional education in high school level. Such finding indicates a trend of a higher number of researches aimed at the technical-pedagogical issue of specific cases, related to learning virtual environments, as well as the political importance credited to technological and professional education in the current Brazilian educational policies (AMORIM, 2013; PENA, 2014). Recent investigations from Mancebo, Vale and Martins (2015, p. 39) support the version that the higher education expansion programs are directly related to the trend of "more work from the teacher" and "teaching streamlining". This, in a certain way, justifies the interest and the data presented in these theses. We need to understand better the disorders we have been facing in education due to the meanings and senses that the technologies assume in the training context, now denaturalizing the communicative processes and causing misunderstandings, other times empowering naïve technicalities of abstract legitimation, serving as palliatives for emancipated decision-making.

Historically, professional education was conceived to train the professional to do things, for the technical, subservient and managed work, aimed to the bureaucratic control of the schools. There was the predominance of information and the professional-technical teaching instead of the human and critical development. In an effort to respond to the lack of pedagogical practices, a misunderstanding of taking the practical issues as technical demands is perpetuated and, when this happens, we leave aside the conceptual apparatus which give meaning to the actions of teaching and learning, abbreviating the reflexive and formation process. For Hermann (2002, p. 88): "there is nothing wrong in the technique, except when it tutors the process without making it clear the bases for its procedure and when it intends to closure the productivity of a process – which consists in the opening to another one – in its logic regulations".

The initial training and the continuous experience of the teachers for the use of the ICT is a problem which constantly reappears in the theses. Although it is considered in the legislation as a target to be achieved, it still remains as quite a deficit because of the lack of investments in the teacher training, especially for its use and pedagogical reconstruction/renovation (GATTI, 2010). It should be noted that the opening of Federal Institutes also

critics to the relationships of exploration of the social power, in a lively conversation which confronts the interlocutors in the practice, transforming them according to new contexts.

marks a concern in meeting the regional contexts and local needs, contributing for the production of knowledge in its locus of professional action and getting, with the strong investment and the offering of distance teaching, new outlines in the network of professional and technological education. The researches point out that many teachers from the technical area are unaware of the potentialities of the technologies integrated to education as well as they ignore the legislation concerning distance teaching, which proclaims the reconstruction of activities for the contexts of *cyber research*.

Thus, the results of the most expressive production of knowledge in the field (fourteen theses) are the ones which consider the legislation and the planning of technological initiatives for the professional education and placement in the work world. In education these provocations and reflections present themselves in a tense relationship between the perverse illusions of a shortened professional learning (linked to the immediate and technical *rankings* of performance, of effectiveness and efficiency) and the global and political processes (with questions and appeals from the corporate version), which bring to education a process of loss of formative sense, homogenization and rationalization (automatizing our actions and decisions).

Pedagogical practices and democratization of access to the ICT

The composition of this group is made through the approaches B, D, E and G of the Figure 2, converging the discussions for the polemics about the negligence of the technological processes in the academic training of the teacher, thus entering into the ways how the teaching and learning processes are conducted at the educational institutions. These theses point out to the need of providing theoretical and practical subsidies so that the teacher knows how to use the diverse technologies as a mean of pedagogical reflection, carrying out a critical dialogue in a society that progresses much more in instrumental terms than in human ones.

In this context, we found in the concept of one-dimensionality the base for a criticism of technology, characterized by the total administration in the advanced societies, of the technical modes of thinking and acting, which limit the communication as a leveling technical action (HABERMAS, 1988). The instrumentality itself does not oppose to the social norms as every attitude has a social dimension of learning for life, since the virtual or real language is a modifier of the action itself.

Another problem noticed repeated times in these theses is that Technologies entered into schools too late, form the implementation of microcomputers in computing centers provided by governmental and technical projects via the National Program of Educational Technology (Proinfo) and in the educational *laptops* from Prouca[5]. With such inclusion, the question is not only about the artificial integration of technologies in teaching but also how in a teaching training which takes the technical functionality as a natural language.

5- To illustrate, the ambiguity of the technologies is noticed in theses that analyze the experiences planned by the federal government for the use of the portable computer from Prouca (Project One Computer per Student), which show positive changes in the curriculum, in digital literacy, in the interest and in the teamwork but, at the same time, it reveals that the pedagogical exploration of these artifacts in the recreation brings miserable results.

The pedagogical work with the technologies ends up being a final element, caring less for both the formative role of education and for the interdisciplinary dynamic of cultural binding and commitment with the world.

As we advance a little further in the debate, the researches of Santos (2012), Matos (2013) and Weckelmann (2012) materialize the outbreak of distance teaching in learning virtual environments related to indicators of higher dialogic and pedagogical potential among the researched theses, mentioning possibilities and limitations by the human-computer interaction. The teacher training for the pedagogical use of the ICT in the age of mobility is one of the means for the understanding of reality. The pedagogical utopias as well as the researches arise to reinforce the hope in the training and to fight for the construction of a new project of reconciliation with the other one, which although it might never be fully achieved, it keeps the perspectives of one unfinished projecting itself. For such reasons, everything indicates that doing research in the field of ICT is like strongly questioning in order to keep the critical spirit identified in the reflexive power that the technologies may favor.

But, if the knowledge and the interest as well as the science and the technique are interwoven in a process of mutual binding and feedback, as seen by Habermas (1990), why is there an idea of reporting only good practices in events about technologies in education? The challenge of using the technologies for the training consists in developing the opportunities of social learning not only with the presentation of successful cases (permeated by unquestioned truths and hegemonic concepts), but with the development of integrating projects to think and renew the practices, in order to keep an open dialogue with different changing worlds.

The possibility of discussion is one of the criteria of scientification since the technical-scientific advance is connected to exchanging ideas with another one and to the capacity of having a dialogue in field of tensions and contradictions with the social practice. However, we need to acknowledge that the systemic paradigms, which help to consolidate scientific advances, when they become dominant, start to resist to changes and questions, preferring the compliments to the criticisms. The democratization of the face-to-face teaching or the distance teaching is a right for everyone but it has to be justified with the access to institutionally solid formative structures and with the quality of the pedagogical processes. On the contrary, we will be only reverberating the innovation and the technology in education as jargons.

Legitimation of the discourses on ICT and EaD (Distance Education)

This group is composed by the theses of the approaches C, F, I and J of the Figure 2, converging its study focus to a process crossed by relationships of contradictory power, which present fruitful discourses of democratization and expansion of the programs of technical computerization in the educational systems, but perpetuates one-direction views disconnected from the practical needs, which appear by decree (without critical and formative force by the overdose a managed culture and of indifferentiation of the communication). Here we notice that the change lies in making known the contradictions

of the technologies in the current society in order not to obstruct its own emancipation. The uniformization of the technologies and of the intellectual function may make up the domination over the senses, therefore meaning a leveling of thinking in relation to the production of a consensus and the impoverishment of experience, due to isolation in the collectivity guided by coercion and conformism (ADORNO; HORKHEIMER, 1985).

According to Barros (2014), the legitimation of the discourse of digital divide becomes a problem of social nature and not only a technological one. With distance teaching, there is an evident global democratic expansion and the consequent commercialization of culture, added by its low cost in functional terms. There is also the need to relate the technological languages in the different educational spheres and in the teaching actions and processes, as mentioned in the National Curricular Guidelines for the course of Pedagogy (BRASIL, 2006), as well as in the National Education Plan 2011-2020 (BRASIL, 2010). The reconstruction of knowledge in the educational sphere imposes the need of constant updating due to the fact we face times of rapid changes which deprive from meaning, when the technical knowledge becomes a limitless power.

The reconstruction of knowledge by the pedagogical and technological mediation may arise as a possibility of change directed to the respect to different worldviews and to the technological literacy through a learning communicative rationality (which renews itself, develops itself and transforms itself). According to Arruda (2012, p. 296), all the ones involved in the teaching and learning process are composed in the "perspective of the relationship" and contact with the other one, as "the teacher, as a mediator of conflicts and emotions, incorporates a practice in which the dialogue, the writing, the respect for the differences and emotions indicate the possibility of inverting the logic a practice of a prescriptive transfer of knowledge".

The problematic noticed in the theses reveal the contradictions between the guidelines expressed in the public policies and the reality of the school life, which leads to the de-motivation of the teachers as well as to a rejection concerning the development of reconstructive and integrating projects, aimed to improve the processes of social learning. In the perspective of the technological changes we highlighted the need to reconsider the controversies and confusions concerning the teacher training in the face of an anthropology of cyberspace to deal with the difficulties in the pedagogical scope of teaching and learning, from the point of view of the human, epistemological, sociological, psychological, economic, anthropologic and historic construction (BICUDO, 2003; SANTOS, 2012).

Thinking about training implies reconstructing the theories in inter-subjective bases, of freedom as an opening for the dialogue, to go beyond the use of the technologies of an abstract form and/or associated to the metaphor of the platonic cave as an adaptative and de-ideologized screen, as Saramago exposes (2000). The metaphor illustrates that for the person, to think, it was necessary to leave the cave to give a new meaning to the world, serving as a source to uncover that it would be necessary to leave the computer screen in order to look, hear, feel and think. Thus, as the law becomes an instrument of colonization in the world of life and language, which may be corrupted by the system, the technology also makes the mediation between the system and the functions of the life world. If this

mediation is not clear about the formative function of thinking and reconstructing with the ICT, it easily incurs in isolation and reduction of the pedagogical relationship to the mastery of the technique, justifying processes of 'pedagogization', fragmentation, bureaucratization and ranking of teaching.

Amidst the uncertainties, the convergences, the contradictions, the conflicts and challenges of the theses produced about the technologies in education, it is understood that the education which can overcome the individualistic, confusing, undetermined relationships and of reified communication is the one that can be based on the alterity and acknowledgement as it fosters, through the dialogue (virtual or real) the learning with each other. We learn to see the world by exercising alterity and by the connections which trigger some metamorphosis of knowledge, which aim to transform the acts of narrating and translating in a problem to consider the technological relationships from the experience of relearning (ASSMANN, 2000). Therefore, the rationality of the pedagogical action goes beyond a technical discourse alienated from the world, a simplifying one, anaesthetized and guided towards the purposes of education, in order to provoke our understanding in the essential dynamic of acting, which sees in the TIC new ways to face their own existence, learning to their own training and taking their own responsibility and responsibility for the other one in the reconstructive, sensitive, critical opening to the world of culture.

According to Habermas (1990), the intersubjectivity is no longer produced by the perspectives of the life world but it is given with the complex interactions symbolically regulated, that is, through the analysis in processes of communication, as a way to overcome the reductionist traps and the flaws of erroneous readings. We are motivated by the language which pleads for the cognition, normative self-understanding and for new horizons, as this language justifies our knowledge and understanding of the life world with other subjects communicatively socialized. Although technology also organizes the human action, many times, relieving the manual labor, this does not mean that the renunciation of intellectual, creative, communicative, comprehensive effort and the capacities of acting in the world. That way, Benjamin (2012) saw in photography, for instance, the revelation of unconscious aspects of the collectivity, triggered by the creative cooperation, since the camera revealed another look for the reality, enabling more open readings concerning the redemption of social utopia. Thus, he envisioned with the technology an emancipatory instrument of social change and a possibility of political resistance in the transformation of gloomy and destructive aspects of the technique, through an experience of social learning, linked to a shared time and work, in the same universe of practice and language.

Constitutive tensions and perspectives for the technologies in education

Any cultural creation carries with it an integrated ideological vision in the reality of the languages in which it materializes itself, in the struggle for interests and in the communicative games between the agents (HABERMAS, 1990). The pure submission to the technical apparatus, in terms of hyperspecialization, broadens the amenities of life, as well as the autonomy of work, producing a dependence which may,

simply, be seen as an onus of the technological progress itself. In an attitude of non passivity before these innovations we question: Can the tensions and convergences of the theses stimulate the dialogue between the different types of knowledge and help its reconstruction as part of the process of training and research? Where can you support the pedagogical knowledge of collective sense, since the human emancipation is not identified with the individualistic and solitary purposes of the progress of science and the technique and the excess of information often escapes from the critical and communicative intent of teaching?

It is very difficult to answer to these questions, as the technologies tend to create multicultural, multidimensional and intercomplementary networks, with potentialities and difficulties for the pedagogical action. Perhaps, as Santaella points out (2003), the potentiality of the technologies is not in the briefness and superficiality of the messages and images, but in the open, dynamic, intersubjective character of the coupling of languages, which characterizes the plasticity of the word usage, producing senses and interacting in the creation of transforming movements. The art of educating through different technologies needs to challenge the human sensitivity for new projects and cooperative senses, of openness for the critical thinking and to the processes of intersubjective (re)creation (listed in the language games), expanding the relationships with the world and with the contemporary questions and demands (of reconstructive and non final relationships with the technologies).

For Habermas (1990), the role of the technical, practical and emancipatory knowledge in human life assumes an active position in the processes of social learning, on which the understanding of reality, the interests resulting from the action and the reproduction in the life world all depend on. The reality of the social relationships hosts continuous performances between knowledge, power and technology. Such bonds of interests are present in all kinds of social relationship and in the ephemeral time of urgencies, of changes, which is always a disturbance of the perception, because the horizon of experiences gives rise to a fugacious reality of time-speed of the immediate events on the screen (KENSKI, 2013).

In the entanglement of possibilities which are multiplied, the consideration of the learning technologies recreated in education is something recent in Brazil (BRASIL, 2006, 2010). Some scholars (LÉVY, 1996; HABERMAS, 1990) have highlighted strategies for the relationships between education and technology and have pointed out difficulties which need to be overcome, having in mind its implementation and consolidation in all dimensions of social life.

In the educational scope, the foundation of the Brazilian Association of Distance Teaching (Abed) and of the GT Education and Communication (GT 16), of the National Association of Graduate Studies and Research in Education (Anped), as well as the debates of the Thematic Axis Education, Communication and Technology, of the Regional Scientific Meeting of Anped Sul, were some initiatives for the constitution of study groups in educational technologies. Besides an explicative perspective identified only with the report of hazards concerning the usage of the technologies in education, we intend to foster dialogues and the construction of a network of researchers who consolidate the

researches carried out so far to confront their problems and aiming at the renovation of the field of investigation.

It seemed for some time that the study on the technologies keep an Idea of innovation and seduction as it represented a new topic in education, widespread in events from good practices. Maybe its frialty lies on the unconcern with the renovation of practices, by the reconstitution of usages, knowledge, methods and pedagogical sensitivities, preferring to emphasize the descriptive and technical-operational content of the technologies instead of forging pragmatic relationships with the other areas of life, also under transformation. Thus, it is neglected the way how these technologies are articulated and gathered, tending to merely constitute an affirmative rudimentary practice of technical consolidation, without taking into consideration the diversity of pragmatic, metaphoric, sensorial-motor and cognitive effects involved, as well as the necessity of carrying out a *self-questioning of the ideologies* (HABERMAS, 1990).

If, on one hand, the use of the technologies may work out as an awakening for curiosity and the quest of development through research, on the other hand, it brings the demand that the teacher is not merely showing the showcase of the facts. The problematization and the dialogue about the information promote some strangeness and acknowledgement of other relationships with the apparatus of the technology. These demands have caused tensions and anxieties concerning the pedagogical relationships, as well as in what refer to the absence of technological training and education, reinforcing a trend to digital divide. This creates an individualistic perspective of acting, instead of the so wished reconstruction of social knowledge by the democratic inclusion. The growing interest of researchers for the field of technologies in education is noticeable, which helps to expose a certain perplexity and discomfort of some teachers when they see themselves before subjects who can no longer express their ideas without the mediation of digital artifacts, for example. This ambivalence between the promotion of the technologies and the doubt about handling with it is found in the theses we analyzed, either under the prism of the policies, of practices and of the apparatuses considered, or the indicated conclusions, resulting in perplexities and uncertainties in the transit between virtuality and the pedagogical reality, focused on the promotion of knowledge sensitive to human development.

Final considerations

The mapping of these theses presented contributions for the empirical investigation on the technologies in education with a highlight for the articulation of pedagogical knowledge to the technological ones in improved teaching proposals. Considering the context of the analyzed productions, what is noticed is the demand for a transformation and renovation of the educational discourse in terms of investments in the professional training to work with the technologies in the complexity of teaching, as well as in terms of some input for a pedagogical theory based on the interdisciplinarity and the access to the ICT. Assuming that in the pedagogical work a critical cooperation is essential, we noticed that the lack of implementation of ways of thinking and acting in pedagogical terms in

the interdisciplinary exercise about the world perpetuates a technical-scientific utopia of passive and indiscriminate actions (pseudo-innovative to the collective emancipation). The self-referring language of the technologies which arises by force excludes the dialectic openness to the other and it causes dispersion or frantic stimulation, both attitudes do not contribute in a responsible way for the advance of researches and practices. For Sibilia (2012, p. 91), "the apathy and the hyperactivity would be two complementary effects of contemporary saturation: results of the contact with an evanescent mean in which everything happens dizzyingly, leaving no marks".

The acknowledgement of the technologies in education implies in understanding that every knowledge is fragmentary and, because of this, we can no longer give up research and criticism to attribute sense to reality and to the values of human tradition, constituting the other and ourselves by a group of roles and meanings that our cultural production is assuming in the daily practice. In terms of the general overview of circularity of the discourses in the field of the technologies in education, which complicates the handling of data either because of the expansion and range of topics studied, or because of the delay in making the theses public in the digital repositories, the changes in the sense of improving the practices and researches are sensitive. We believe that there are still many properties of the technologies that we are unaware of concerning the human development (of critical and learning cooperation) for the improvement in the quality of education but simply including these technologies is not enough as the training keeps the commitment of (re)establishing the communicative connections to understand the world in its diversity. The mapping carried out in the present work is particularly relevant to carry out the challenge of understanding the senses and meanings of the technologies in education to go beyond the descriptive view of success of some practices, emphasizing the pedagogical processes open to the critical interlocution.

Referências

ADORNO, Theodor; HORKHEIMER, Max. **Dialética do esclarecimento.** Tradução de Guido A. de Almeida. Rio de Janeiro: Zahar, 1985.

AMORIM, Monica Maria Teixeira. **A organização dos institutos federais de educação, ciência e tecnologia no conjunto da educação profissional brasileira.** 2013. 245f. Tese (Doutorado) – Faculdade de Educação da Universidade Federal de Minas Gerais, Belo Horizonte, 2013. Disponível em: <http://www.bibliotecadigital.ufmg.br/dspace/handle/1843/BUOS-9AZGC8>. Acesso em: 14 nov. 2015.

ARRUDA, Marina Patrício. O paradigma emergente da educação: o professor como mediador de emoções. **Educação Temática Digital,** Campinas, v. 14, n. 2, p. 290-303, 2012. Disponível em: <https://periodicos.sbu.unicamp.br/ojs/index.php/etd/article/view/1235/1250>. Acesso em: 28 fev. 2016.

ASSMANN, Hugo. A metamorfose do aprender na sociedade da informação. **Ciência da Informação**, Brasília, DF, v. 29, n. 2, p. 7-15, maio/ago. 2000. Disponível em: <http://www.scielo.br/pdf/ci/v29n2/a02v29n2.pdf>. Acesso em: 28 fev. 2016.

BARROS, Joy Nunes da Silva. **Democracia e utopia na sociedade do conhecimento:** reflexões sobre a educação a distância. 2014. 227 p. Tese (Doutorado) – Faculdade de Educação da Universidade de São Paulo, São Paulo, 2014. 227 p. Disponível em: <http://www.teses.usp.br/teses/disponiveis/48/48134/tde-13102014-160035/pt-br.php>. Acesso em: 28 fev. 2016.

BENJAMIN, Walter. **Magia e técnica, arte e política:** ensaios sobre literatura e história da cultura. Tradução de Sérgio Paulo Rouanet. 8. ed. São Paulo: Brasiliense, 2012. (Obras escolhidas; 1).

BICUDO, Maria Aparecida Viggiani. Prólogo. In: BICUDO, Maria Aparecida Viggiani (Org.). **Formação de professores?** Da incerteza à compreensão. Bauru: Edusc, 2003. p. 7-17.

BRASIL. Ministério da Educação. **Parecer CNE/CP 01/2006, de 16 de maio de 2006.** Institui as Diretrizes Curriculares Nacionais para o curso de graduação em pedagogia. Brasília, DF: 16 maio 2006. Disponível em: <http://portal.mec.gov.br/cne/arquivos/pdf/rcp01_06.pdf>. Acesso em: 05 jan. 2016.

BRASIL. Ministério da Educação. **Plano Nacional de Educação.** Projeto de Lei nº 8.035 de 2010. Aprova o Plano Nacional de Educação para o decênio 2011-2020 e dá outras providências. Brasília, DF: 15 dez. 2010. Disponível em: <http://portal.mec.gov.br/index.php?option=com_content&id=16478&Itemid=1107>. Acesso em: 17 jan. 2016.

GATTI, Bernardete A. Formação de professores no Brasil: características e problemas. **Educação e Sociedade,** Campinas, v. 31, n. 113, p. 1355-1379, out./dez. 2010.

HABERMAS, Jürgen. **Dialética e hermenêutica:** para a crítica da hermenêutica de Gadamer. Porto Alegre: L&PM, 1987.

HERMANN, Nadja. **Hermenêutica e educação.** Rio de Janeiro: DP&A, 2002.

HABERMAS, Jürgen. **O discurso filosófico da modernidade.** Lisboa: Dom Quixote, 1990.

HABERMAS, Jürgen.**Teoría de la acción comunicativa:** crítica de la razón funcionalista. Tradución de Manuel Jiménez Redondo. Madrid: Taurus, 1988. Obra originalmente publicada em 1981.

JENKINS, Henry. **Cultura da convergência.** Tradução de Susana Alexandria. 2. ed. São Paulo: Aleph, 2009.

KENSKI, Vani Moreira. **Tecnologias e tempo docente.** Campinas: Papirus, 2013.

LÉVY, Pierre. **O que é o virtual?** Tradução de Paulo Neves. São Paulo: Editora 34, 1996.

MANCEBO, Deise; VALE, Andréa A.; MARTINS, Tânia B. Políticas de expansão da educação superior no Brasil. **Revista Brasileira de Educação,** Campinas, v. 20, n. 60, p. 31-50, jan./mar. 2015. Disponível em: <http://www.scielo.br/pdf/rbedu/v20n60/1413-2478-rbedu-20-60-0031.pdf>. Acesso em: 17 jan. 2016.

MATOS, Ecivaldo de Souza. **Dialética da interação humano-computador:** tratamento didático do diálogo midiatizado. 2013. 269 f. Tese (Doutorado) – Faculdade de Educação da Universidade de São Paulo, São Paulo, 2013. Disponível em: <http://www.teses.usp.br/teses/disponiveis/48/48134/tde-05062013-105842/pt-br.php>. Acesso em: 07 jan. 2016.

PENA, Geralda Aparecida de C. **Docência na educação profissional e tecnológica:** conhecimentos, práticas e desafios de professores de cursos técnicos na rede federal. 2014. Tese (Doutorado) – Faculdade de Educação da Universidade Federal de Minas Gerais, Belo Horizonte, 2014. Disponível em: <http://www.bibliotecadigital.ufmg.br/dspace/handle/1843/BUBD-9HKFU8>. Acesso em: 07 fev. 2016.

SANTAELLA, Lúcia. **A ecologia pluralista da comunicação conectividade, mobilidade, ubiquidade.** São Paulo: Paulus, 2010.

SANTAELLA, Lúcia. **Cultura das mídias.** 3. ed. São Paulo: Experimento, 2003.

SANTOS, Vanice dos. **Ágora digital:** o cuidado de si no caminho do diálogo entre tutor e aluno em um ambiente virtual de aprendizagem. 2012. Tese (Doutorado em Educação) – Faculdade de Educação da Universidade Federal do Rio Grande do Sul, Porto Alegre, 2012. Disponível em: <http://www.lume.ufrgs.br/handle/10183/49410> . Acesso em: 07 fev. 2016.

SARAMAGO, José. **A caverna.** São Paulo: Companhia das Letras, 2000.

SIBILIA, Paula. **Redes ou paredes:** a escola em tempos de dispersão. Tradução de Vera Ribeiro. Rio de Janeiro: Contraponto, 2012.

WECKELMANN, Valeria Faria. **Indicadores de mudanças nas práticas pedagógicas com o uso do computador portátil em escolas do Brasil e de Portugal.** 2012. 374 p. Tese (Doutorado) – Pontifícia Universidade Católica de São Paulo, São Paulo, 2012. Disponível em: <http://www.sapientia.pucsp.br/tde_busca/arquivo.php?codArquivo=15373>. Acesso em: 08 jan. 2016.

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