

TEACHER FORMATION AND PEDAGOGICAL TECHNICISM: A CHALLENGE OF CONTEMPORARY EDUCATION

A FORMAÇÃO DOCENTE E O TECNICISMO PEDAGÓGICO: UM DESAFIO PARA A EDUCAÇÃO CONTEMPORÂNEA

FORMACIÓN DOCENTE Y TECNISCISMO PEDAGÓGICO: UN DESAFÍO PARA LA EDUCACIÓN CONTEMPORÁNEA

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ABSTRACT: The discussion about teacher formation generates convergences and divergences between technical and innovative pedagogy. In this sense, the theme challenges educators, especially those working in higher education, to reassess educational practice, because learning based on conservative paradigms domesticates and immobilizes the subjects involved in the teaching-learning process, limiting their intellectual rebellion. Based on this premise, this article addresses teacher education and knowledge fragmentation, a heritage of conservative education paradigms based on traditional, escolanovista, and technical approaches. This article provides a reflection on the pedagogical practice in higher education in teacher education and seeks to provoke a discussion about the reflective teacher. In addition, the article addresses Newtonian-Cartesian thinking, technicism and the insertion of technologies in education, in order to problematize the convergences and divergences between the technician and innovative paradigms.

KEYWORDS: Teacher formation. Pedagogical currents. Technologies in education. Teaching practice. University education.

RESUMO: *A discussão sobre a formação docente suscita convergências e divergências entre correntes pedagógicas tecnicista e inovadora. Nesse sentido, a temática desafia educadores, especialmente aqueles que atuam na docência do Ensino Superior, a reavaliar a prática docente, pois a aprendizagem pautada em paradigmas conservadores domestica e imobiliza os sujeitos envolvidos no processo ensino-aprendizagem, tolhendo-lhes sua rebeldia intelectual. Com base nessa premissa, este trabalho aborda a formação docente e a fragmentação do conhecimento, uma herança advinda dos paradigmas conservadores da educação, a partir das abordagens tradicional, escolanovista e tecnicista. Este trabalho oportuniza uma reflexão sobre a prática pedagógica no Ensino Superior na formação docente, e busca provocar uma discussão sobre o professor reflexivo. Além disso, o trabalho aborda o*

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pensamento newtoniano-cartesiano, o tecnicismo, e inserção das tecnologias na educação, no intuito de problematizar as convergências e as divergências entre os paradigmas tecnicista e inovador.

PALAVRAS-CHAVE: *Formação docente. Correntes pedagógicas. Tecnologias na educação. Prática docente. Docência no ensino superior.*

RESUMEN: *La discusión sobre la formación docente plantea convergencias y divergencias entre la pedagogía tecnicista y la innovadora. En este sentido, el tema desafía a los educadores, especialmente a aquellos que trabajan en la enseñanza de educación superior, a reevaluar la práctica educativa, porque el aprendizaje basado en paradigmas conservadores, domestica e inmoviliza a los sujetos involucrados en el proceso de enseñanza-aprendizaje, limitando su rebelión intelectual. Basado en esta premisa, este documento aborda la formación del profesorado y la fragmentación del conocimiento, una herencia de paradigmas conservadores de la educación, basados en los enfoques tradicionales, escolanovistas y tecnicistas. Este artículo proporciona una reflexión sobre la práctica pedagógica en la educación superior en la formación del profesorado, y busca provocar una discusión sobre el profesor reflexivo. Además, el documento aborda el pensamiento newtoniano-cartesiano, el tecnicismo y la inserción de tecnologías en la educación, para problematizar las convergencias y divergencias entre los paradigmas tecnicistas e innovadores.*

PALABRAS CLAVE: *Formación docente. Corrientes pedagógicas. Tecnologías en la educación. Práctica docente. Enseñanza en la educación superior.*

Introduction

In this article, it is proposed to discuss teacher formation and pedagogical technicism with teaching in Higher Education as a contextual spectrum. Initially, it is worth pointing out that this reflection has its origin in discussions and dialogues brought from a communication held at the IV International Seminar on Teacher Professionalization, where the pedagogical technicality and the reflective teacher were discussed in a broad context of education. However, although the textual and theoretical references of that communication have been maintained in a good measure in the current text, the reflection was added to new outlines and contributions that justify the resumption and expansion of the debate. In this sense, we will try to present some epistemological paradigms of education in Brazil, considered as conservative, with traditional, scholastic and technical approaches, their divergences and contributions to contemporary education, especially in teaching in Higher Education.

It is noticeable that over the years the Brazilian educational system has gone through several pedagogical conceptions that, in concise terms, can be understood as the different ways in which education is theorized and practiced, that is, constituting the very substance of

educational practice. Such conceptions were often embraced in an almost soteriological, rather than methodological, character, especially when motivated or guided in a reproductive perspective of society and the world of work. It is well known that in a globalized and competitive society, the world of work has the challenge of dealing, among other things, with professional competition, since there is no *captive profession*, therefore holding the exclusive labor market. By adhering to this reflection, it is known that education can contribute to the transition to a new reality and understanding of this world of work.

The analysis of the proposed theme allows to permeate discussions that contribute to the challenge of a pedagogical practice that, not only corresponds, but that questions the needs of a society in constant changes. This implies stating that discussing topics such as teaching in higher education, teacher formation and pedagogical technicism provides the subjects involved in the teaching-learning process with moments of deep reflection. The teacher often encounters the complexity of the teaching work and, given the deficiency in the processes of continuing education and the insufficient opportunities in this sense offered by higher education institutions, the practice becomes a formative opportunity when it enables the critical reflection of the action taken, giving rise to the planning of future actions. Despite the opportunity to find space for training and critical reflection in the reflection of the practice, care must be taken not to agree with the idea that the practice itself can replace the theoretical study.

In these reflections the present text dares to address the insertion of the discussion on the use of technologies in education to contribute to the crossing and at the same time provoke reflection on the Newtonian-Cartesian and systemic paradigms. We refer, here, to the use of technologies as didactic resources that strengthen the pedagogical action and not as an end in itself. With regard to the use of educational technologies, teaching in Higher Education, especially in the formation of teachers, cannot be indifferent to the changes that the world of work is facing. In this line of reasoning, Tescarolo makes an important warning to be considered:

It is no longer possible to deny or avoid the formidable impact that new technologies linked to the development of informational networks are having on human activities, not only those linked to production and work, but also and mainly to the world's conditions of living (TESCAROLO; GASQUE, 2007, p. 43).⁴

⁴ Não é mais possível negar ou evitar o formidável impacto que as novas tecnologias ligadas ao desenvolvimento das redes informacionais estão produzindo nas atividades humanas, não apenas aquelas ligadas à produção e ao trabalho, mas também e principalmente à condição de vida do mundo. (TESCAROLO; GASQUE, 2007, p. 43).

In this sense, formation, in addition to being solid, must correspond to the needs of an education that, above all, does not underestimate the handling of educational technologies, as it understands them as a creative process through which material and immaterial resources can be used in order to find answers to the problems of their daily lives, overcoming them. That is, the use of such technologies challenges the teacher to seek a formation that helps him to innovate his teaching practice and that can contribute to the process of reflection on teaching.

In relation to the reflective teacher, the article prioritized the discussion of pedagogical practice, with the objective of overcoming the fragmentation of scientific knowledge, since it starts from the principle that to know the parts it is necessary to know the whole, and then to know the parts and not the other way around. Thus, a teaching performance in Higher Education, conceptually solid and cohesive in its practices, can enable the subjects of the teaching-learning process to have an integral formation that results in citizenship. The reflection on teaching practice in higher education becomes fundamental and necessary to enable a more consistent performance of teaching, so that the educator can develop his work successfully, considering that acting as a teacher means being part of a process that it demands technical competence and political ethical commitment. However, it should be noted that reflection on practice does not solve everything, the reflected experience does not solve everything. As stated by Libâneo (2005, p. 76), “strategies, procedures, ways of doing are necessary, in addition to a solid general culture, which help to better perform the work and improve the reflective capacity on what and how to change”⁵.

In order to be able to weave teacher formation, pedagogical technicism, educational technology and reflective teacher, in addition to dialogue with contemporary pedagogical perspectives, the arguments in this article sought to discuss the following questions: How does teaching in Higher Education, in teacher formation, can dialogue with the current educational scenario in a society whose changes are abrupt and inevitable? What are the implications of the technical approach to education in a globalized and competitive world of work? What advantages does the reflective teacher have when adopting educational technologies in his teaching practice to promote a more just, ethical and humane education?

Based on these questions and based on reflections from pedagogical discussions, it was possible to reflect on the theme in dialogue with education theorists. In this way, it was possible to provoke a discussion about the reflective teacher, to approach Newtonian-Cartesian thinking, technicism, the insertion of technologies in education and, finally, to analyze the convergences

⁵ “necessárias estratégias, procedimentos, modos de fazer, além de uma sólida cultura geral, que ajudam a melhor realizar o trabalho e melhorar a capacidade reflexiva sobre o que e como mudar”

and divergences between the technicist and innovative paradigms. In short, it is worth reiterating that the theoretical foundation of the article prioritized the critical analysis of specialists who have literature and study the theme, as we will see below.

The reflective teacher and Newtonian-Cartesian thinking: a critical analysis of the Brazilian educational system

During the research and theoretical survey on the theme, it was possible to observe that, in the history of Brazilian education, the educational system was the target of influences from different epistemological paradigms. The discussion about teaching paradigms enriched the reflections, since the contributions from the debate are significant and demonstrate that

[...] the paradigm plays a role that is both underground and sovereign in any theory, doctrine or ideology. The paradigm is unconscious, but it irrigates conscious thinking, it controls it and, in this sense, it is also super-conscious (MORIN, 2004, p. 26).⁶

Thus, it is possible to affirm that the paradigms function as regulations and rules through which the human being makes a reading of reality, judging and classifying the phenomena and what “[...] individuals know, think and act according to inscribed paradigms culturally in them”⁷ (MORIN, 2004, p. 25). Analyzing the pedagogical current in the light of the epistemological paradigm also contributes to understanding the context and the construction of the current thinking itself, as well as the influence on the educational system and, consequently, its pedagogical choices and practices.

In the case of technicist pedagogy, it is necessary to place it under the aegis of the influence of Newtonian-Cartesian thought in education, which assumes that phenomena can be understood if they are reduced to the parts that constitute them. That is, when knowing a part of a system, the researcher will come to know about its functioning, says Capra (1996). If we agree, the thinking of Vasconcellos (2002), who believes in the overvaluation of the mind that originated in the Cartesian paradigm, dichotomies that resulted in the fragmentation of knowledge and in the linear and mechanistic conception of history would become evident.

Following this conception, the human being, in fact, becomes the master of the world, as he believes in his ability to transform, explore, serve himself and enslave nature as stated by

⁶ [...] o paradigma desempenha um papel ao mesmo tempo subterrâneo e soberano em qualquer teoria, doutrina ou ideologia. O paradigma é inconsciente, mas irriga o pensamento consciente, controla-o e, neste sentido, é também supraconsciente (MORIN, 2004, p. 26).

⁷ “[...] os indivíduos conhecem, pensam e agem segundo paradigmas inscritos culturalmente neles”

Capra (1996). For Behrens and Oliari (2007, p. 59), the Newtonian-Cartesian paradigm insists on the separation of mind and matter and fragmentation of knowledge in different parts to seek greater effectiveness. Such a way of thinking led mankind to divide knowledge into as many parts as possible and acquired in this way a fragmented view of the reality that surrounded them. This paradigm brought to education a heritage of fragmentation of knowledge and an overvaluation of the rational vision, and proposed the primacy of reason over emotion, thus dividing knowledge into areas, courses and disciplines, reaching and reducing the teacher's pedagogical practice, especially in higher education, where the division of knowledge into areas sometimes overlap altogether.

In these conditions, the Newtonian-Cartesian paradigm appears to be well defined as a guide for educational practices, whose ideas and assumptions are very well outlined; moreover, it constitutes more general and determinant structures not only in the way of conceiving education, but also in the way of acting educationally. This conception and practices can be observed, for example, in the curricular structures and in the chairs that, at times, suppose the knowledge so fragmented that it becomes necessary the exoticity of interdisciplinary actions, that is, recognizing the fragmentation of knowledge in the curriculum architecture itself.

Based on the reductionist vision of knowledge defended by technicality, the reflective teacher challenges the integral formation of the individual, as the human being is an indivisible being who “participates in the construction of knowledge not only through the use of reason, but also by combining emotions, feelings and intuitions”⁸ (BEHRENS, 2007, p. 62). Based on this understanding, it is possible to affirm that the reflective teacher is the subject capable of critically analyzing the historical, social, cultural and organizational contexts in which his teaching practices occur, thus being able to intervene in this reality and transform it. Therefore, it is up to him to transform the dynamic, creative and global teaching-learning process. Furthermore, it is a systemic education whose purpose is to defend the cosmic totality, since the world is dynamic and its interaction takes place in connection with other elements determined by the dynamics of the whole.

In this respect, it would not be pertinent for the parts that make up the world to be understood as isolated entities. The fragmented view caused by the Cartesian Newtonian paradigm led to the reproduction of knowledge, and the more the student reaches higher education, the more this fragmentation is perceived. Therefore, the teacher has a duty to provide the student with an educational system that prioritizes the rescue of the individual as a whole.

⁸ “participa da construção do conhecimento não só pelo uso da razão, mas também aliando as emoções, os sentimentos e as intuições”

Thus, in the current situation, the education system that is compatible with the new reading of the world arising from the systemic and complex view of the universe is entitled. In other words, an education that recovers the “balance between intuition and reason, proposing teaching and learning that lead to the production of autonomous, critical and reflective knowledge and the construction of a more just, egalitarian, fraternal and solidary society”⁹ (BEHRENS, 2007, p. 65). For this, an education based on critical and creative reflection is necessary. In this way, “reflection and education are indissoluble themes or, at least, they should be, that is, the school must be, necessarily and essentially, the geographical place of construction and critical dialogue”¹⁰ (GHEDIN, 2002, p. 146). The reflective teacher must make efforts so that his students seek a learning that is based on critical reflection, although the process of reflection requires time. Incidentally, Ghedin added:

The reflective process does not come about by chance. It is the result of a long trajectory of formation that extends through life, as it is a way of understanding life itself in its process. It is not impossible to achieve. It is difficult because the society in which we find ourselves, in general, does not provide spaces for the existence of reflection and education, in particular it is often reduced to the transmission of content rather than reflection on them and their generating causes (GHEDIN, 2002, p. 147).¹¹

Given the above, the education we refer to is one that considers both educator and educating *subjects* in educational action, as they are in constant interaction and mediation of the teaching-learning process. It is worth mentioning that the process of interaction and mediation is only possible through a dialogical educational practice on the part of educators, if they believe in dialogue as a human phenomenon capable of mobilizing the reflection and action of men and women. Thus, a teaching practice that differs from banking education is required, as it “annuls the creative power of the students or minimizes it, stimulating their naivete and not creativity, satisfies the interests of the oppressors: for them, the fundamental thing is not the denudation of the world, its transformation”¹² (FREIRE, 2005, p. 69).

⁹ “equilíbrio entre a intuição e a razão, propondo um ensino e uma aprendizagem que levem à produção de conhecimento autônomo, crítico e reflexivo e à construção de uma sociedade mais justa, igualitária, fraterna e solidária”

¹⁰ “reflexão e educação são temas indissolúveis ou, pelo menos, deveriam ser, isto é, a escola deve ser, necessária e essencialmente, o lugar geográfico da construção e do diálogo crítico”

¹¹ O processo reflexivo não surge por acaso. Ele é resultado de uma longa trajetória de formação que se estende pela vida, pois é uma maneira de se compreender a própria vida em seu processo. Não é algo impossível de realizar-se. É difícil porque a sociedade em que nos encontramos, de modo geral, não propicia espaços para a existência da reflexão e da educação, em particular não raro reduz-se à transmissão de conteúdos mais do que à reflexão sobre eles e suas causas geradoras (GHEDIN, 2002, p. 147).

¹² “anula o poder criador dos educandos ou o minimiza, estimulando sua ingenuidade e não a criatividade, satisfaz aos interesses dos opressores: para esses, o fundamental não é o desnudamento do mundo, a sua transformação”

By fragmenting knowledge, Newtonian-Cartesian thinking tends to feed paternalism in the education system, due to the fact that the oppressed are called friendly and 'assisted' (FREIRE, 2005). It is the duty of the teacher as an educator to dare and promote changes in the search for the new. Otherwise, the educational system is in danger of collapsing, as it would be repeating the same mistakes that came from banking education. In search of a liberating education, it is prudent for the teacher to “have the courage to break with himself in order to establish a new understanding of the action and print a new reflexive action, making it possible to expand the power of self-determination”¹³ (GHEDIN, 2002, p. 148). Only with courage and determination will it be possible to think about building responsible citizenship capable of promoting participatory democracy.

Furthermore, it is important that contemporary education provides the subjects of the teaching-learning process with spaces for critical and creative reflection, as a necessary condition for socialization and humanization, thus permeating a new horizon of understanding the meaning of human existence and everything in front of new perspectives, warns Ghedin (2002, p. 149).

Referring also to the Newtonian-Cartesian paradigm, it is important to admit its crisis with systemic thinking. We can even mention the crisis in the relation with technologies in education. On the one hand, it cannot be denied that information technology facilitated communication, as well as shortening distances between the subjects involved in the educational process. Despite this, the ease of dealing with information technologies has caused serious problems for this society in the process of globalization, because shortening distances is not always synonymous with approximation and solidarity between people, as Behrens reminds us:

[...] technical, scientific and electronic advances have not brought fullness of life for men. On the contrary, they came to challenge and distress them, leading to stress, to exacerbated competitiveness, to isolated and fragmented thinking, preventing them from seeing the whole and taking responsibility for isolated acts of men before society (BEHRENS, 2005, p. 28).¹⁴

Following Behrens' line of reasoning, it is not possible to look at global problems separately trying to understand and solve them. Based on a global understanding of the world,

¹³ “a coragem de romper consigo mesmo para poder instaurar uma nova compreensão da ação e dela imprimir uma nova ação reflexiva, tornando possível a ampliação do poder de autodeterminação”

¹⁴ [...] os avanços técnicos, científicos e eletrônicos não trouxeram a vida em plenitude para os homens. Ao contrário vieram desafiá-los e angústia-los, levando ao estresse, à competitividade exacerbada, a um pensamento isolado e fragmentado, impedindo de ver o todo e retirando responsabilidade dos atos isolados dos homens perante a sociedade (BEHRENS, 2005, p. 28).

it is possible to affirm that the Newtonian-Cartesian paradigm is in crisis, since the world started to be influenced by systemic thinking, defending the study of the parts from the whole. In fact, the systemic view is contrary to the fragmentation of knowledge, as proposed by Newtonian-Cartesian thinking. In spite of this, it is important that the teacher in his teaching practice prioritizes the change of paradigms, in order to transform the pedagogical practice.

However, it is worth remembering that no change happens abruptly, driven by threats, ruptures or imposition. Successful change requires *conquest*, *commitment* and *involvement* of the subjects. For this reason, the reflective teacher cannot, under any circumstances, ignore the technological revolution that subtly invades the world. On the contrary, the teacher must understand that educational technologies are potential pedagogical resources, whose purpose is to assist the teacher in his teaching practice. Thus, it is up to the teacher to take an attentive and careful look so as not to fall for the deception of the soteriological perspective of technologies, as they do not replace teaching.

Teaching technologies are here to stay. Therefore, ignoring them would be tantamount to closing your eyes to a path of no return, since your need is constantly immersed. It must be understood that there is a perspective of globalization that has been forcing countries to invest in technology, regardless of their economic possibilities and the necessary respect for the teaching category.

Educational technologies, their insertion in Brazilian education and the effects of technicist pedagogy

Sampaio and Leite (2008) state that the most systematic discussions about education technologies in Brazil started in the 1960s, and their use was based on technical pedagogical theory that used technical resources in education without questioning its usefulness to improve the performance of the teacher.

In his book *Escola e Democracia* (School and Democracy), Dermeval Saviani (1985) makes a critical analysis describing technicist pedagogy, alongside traditional pedagogy and new pedagogy, as a non-critical theory, as his belief lies in the idea that education is the miraculous panacea capable of eradicating the marginality of our society. Saviani is of the opinion that in traditional pedagogy the marginalized is the ignorant and in new pedagogy, the rejected, while in technicist pedagogy the marginalized is the technically incompetent, the inefficient and unproductive. In this pedagogical approach, education plays an important role, because it seeks to overcome the problem of marginality insofar as it forms individuals capable

of contributing to the increase in society's productivity. For Behrens (2005), the set of non-critical theories is inserted within what is called the conservative paradigm, characterizing it by the reproduction of knowledge from repetition and memorization.

Now, technicist pedagogy has its conception of teaching based on behaviorism, also known as behaviorism, a psychological current advocated by Skinner, and on the systemic approach to teaching, which brings scientific neutrality as absolute truth. But technicality in Brazil emerged from the 1960s (1964), due to the “low levels of satisfaction of school demand in relation to the total production and the high levels of dropout and repetition”¹⁵ (KUENZER, 1982, p. 29). In the field of education, behaviorism has as its main characteristic the strict control of pedagogical activities, directed in a mechanical, automatic, repetitive and programmed way. Allied to political and economic interests, technicality focuses efforts on planning and controlling the production method. Kuenzer says:

This theory arises having as central concern the control of the productive process, a necessity generated by capitalist development that, introducing new relations of production from the purchase and sale of labor power, transfers the control carried out internally by the producer, to a higher level than him: that of management (KUENZER, 1982, p. 31).¹⁶

According to teaching behaviorist thinking, the State is at the service of capital, because, in an interventionist way, through education, it manages to interfere in the labor market to the point that the State itself also becomes capitalist, managing profitable companies and prioritizing the production efficiency. In this regard, Frigotto adds:

The interventionist state, in short, will be characterized as the level where intercapitalist interests pass, and it fulfills over time and in an interrelated way: an economic function, while it increasingly becomes a producer of added value or ensuring, by different mechanisms (subsidies, loss absorption) to large private capital this production; a political function while intervening politically to generate favorable conditions for profit; and an ideological function while presenting itself as a mediator of the common good, a force above any suspicion and above class antagonism (FRIGOTTO, 2001, p. 119).¹⁷

¹⁵ “baixos índices da satisfação da demanda escolar em relação ao total da produção e pelos altos índices de evasão e repetência”

¹⁶ Esta teoria surge tendo como preocupação central o controle do processo produtivo, necessidade gerada pelo desenvolvimento capitalista que, introduzindo novas relações de produção a partir da compra e venda de força de trabalho, transfere o controle realizado internamente pelo produtor, a uma instância superior a ele: a da gerência (KUENZER, 1982, p. 31).

¹⁷ O Estado intervencionista, em suma, vai-se caracterizar como o patamar por onde passam os interesses intercapitalistas, e cumpre a um tempo e de modo inter-relacionado: uma função econômica, enquanto cada vez mais se torna ele mesmo produtor de mais valia ou garantindo, por diferentes mecanismos (subsídios, absorção de perdas) ao grande capital privado esta produção; uma função política enquanto intervém politicamente para gerar

In search of scientific neutrality, technicist pedagogy plans “education in order to provide it with a rational organization capable of minimizing subjective interferences that could jeopardize its efficiency”¹⁸ (SAVIANI, 2003, p. 12). Based on the assumption of this so-called scientific neutrality and inspired by the principles of rationality, efficiency and productivity, technicist pedagogy advocates the reorganization of the educational process in order to make it objective and operational. In this aspect, education becomes a closed movement in itself, without any type of interaction with its surrounding environment or with social issues and, therefore, without the capacity for dialogue and to be purposeful of human transformations. Hence the proliferation of pedagogical proposals such as the systemic approach, the micro-teaching, the telenovela, the programmed instruction, the teaching machines.

In technicist pedagogy, the main element becomes the rational organization of the means, with the teacher and the student occupying a secondary position, relegated to the condition of executors of a process whose conception, planning, coordination and control are in charge of supposedly qualified, neutral, objective, impartial specialists. Apparently, this attitude contradicts the understanding that “education is the communication between free people at different degrees of human maturation, it is the promotion of man, part by part, that is, both the student and the educator”¹⁹ (SAVIANI; DUARTE, 2010, p. 423).

The insertion of technologies in the field of education, in technicist pedagogy, is an irreversible reality. In fact, in this perspective, modern technologies are intended, therefore, to solve internal problems, which arose within a reduced scope. In these conditions, technicality ended up contributing to increase chaos in the educational field, generating such a level of discontinuity, heterogeneity and fragmentation that practically made pedagogical work unfeasible. Saviani (2003, p. 15) goes further, stating that “in educational practice, the technicist orientation crossed with the traditional conditions prevailing in schools, as well as with the influence of new pedagogy that had a powerful attraction on educators”²⁰. It is noticeable that there is a strong positivist influence on technicism that causes a split between subject and object, causing education to become fragmented and mechanistic. Thinking like Saviani, we would say

as condições favoráveis ao lucro; e uma função ideológica enquanto se apresenta como um mediador do bem comum, uma força acima de qualquer suspeita e acima do antagonismo de classes (FRIGOTTO, 2001, p. 119).

¹⁸ “a educação de modo a dotá-la de uma organização racional capaz de minimizar as interferências subjetivas que pudessem pôr em risco sua eficiência”

¹⁹ “educação é a comunicação entre pessoas livres em graus diferentes de maturação humana, é a promoção do homem, de parte a parte, isto é, tanto do educando como do educador”

²⁰ “na prática educativa, a orientação tecnicista cruzou com as condições tradicionais predominantes nas escolas, bem como com a influência da pedagogia nova que exerceu poderoso atrativo sobre os educadores”

that in technicality the emphasis of educational practice falls on technique for technique, as it searches manual instructions on how to organize the teaching process.

Skinner, the researcher who influenced technicism, sensitive to changes in his time, used the term Teaching Technology to describe a field that grew out of his studies of human behavior from which, according to him, it would be possible to deduce instructional programs, schemes and methods. In fact, from his line of thought, technologies for teaching were created in order to achieve results. It is obvious that the perspective of educational technology allowed the emergence of new techniques of domination of capital and in the inoculation of a culture of industrial discipline.

However, in the educational environment, prejudice may also have its origin in the educational system experienced by the Brazilian school in the 60s, since, in this period, any attempt to bring new technological equipment produced by the industrial society to the room was associated with a project political and economic, whose objectives were to insert Brazil into the world market as a producer and consumer of goods. This, in education, was translated into the defense of a technicist model, advocating the use of technologies as a factor of modernization of pedagogical practice and solution of all its problems (LEITE; POCHO; AGUIAR; SAMPAIO, 2003).

Sá-Filho and Machado (2003, p. 4) affirm that this model is “fallacious, since the pedagogical relevance of the insertion of educational technology in the pedagogical process will be determined by the appropriate use made of it”²¹. This, perhaps, because the technicist pedagogy whose pedagogical practice is based on the reproduction of knowledge, in the expository classes and repetitive exercises, makes the educational technologies become potential mechanisms to facilitate the faithful reproduction of the content, as well as assimilation and repetition of the it, notwithstanding for technicist pedagogy what matters is earning to do, observes Saviani (2003). In fact, in this pedagogical conception the center of the teaching-learning process is not in the teacher and the student, but in the means applied as pedagogical didactic resources, without questioning their purposes. Saviani says:

In technicist pedagogy, the main element becomes organization, rational of means, occupying the teacher and the student a secondary position, relegated to the condition of executors of a process whose conception, planning, coordination and control are in charge of supposedly qualified, neutral, objective, impartial specialists (SAVIANI, 2003, p. 13).²²

²¹ “falacioso, pois a relevância pedagógica da inserção da tecnologia educacional no processo pedagógico será determinada pelo uso adequado que dela se faz”

²² Na pedagogia tecnicista, o elemento principal passa a ser a organização, racional dos meios, ocupando o professor e o aluno posição secundária, relegados que são à condição de executores de um processo cuja

It is evident that in technical pedagogy the main element becomes the rational organization of the means, while the teacher and the student occupy the secondary position, that is, assuming the condition of executors of a process whose conception, planning, coordination and control are in charge of specialists that are supposedly qualified, neutral, objective, impartial (SAVIANI, 2003). In this sense, technicality misrepresents the real meaning of the use of educational technologies at school. In technicality, the student's role is to learn to do. Here is one of the reasons why we should ask: What can be done so that educational technologies do not become a social problem contrary to human dignity? Is ignoring your insertion in the educational system ideal? What to do, then, so that the current educational system does not repeat the mistakes made by banking education, but to make educational technologies pedagogical tools that can assist the teacher in his teaching practice? In answering the questions, we would say that it is only possible based on a critical analysis of the convergences and divergences arising from the pedagogical confrontation between technicality and the innovative teaching paradigm, as we will see below.

Despite the perspective and concept that can be constructed of educational technologies from the technical perspective, it is necessary to break with the paradigm and the concept itself. Thus, with regard to educational technologies, it is worth clarifying that the meaning of technology is elastic and, therefore, capable of gaining different connotations. In fact, the term technology has a broad meaning that ranges from the simplest processes and tools to the most complex ones developed by mankind. Leite, Pocho, Aguiar and Sampaio (2003, p. 11) help us to broaden our vision and think didactically, by stating that educational technologies can be grouped into two groups: information and communication technologies: television, video, the computer, the radio, the camcorder, the camera, etc.; those not computerized or dependent on electrical or electronic resources: chalkboard, folded board, comics, the newspaper, scrap, book, notebook, pen, etc.; it is worth saying that inserting educational technologies in the current teaching system can favor innovative pedagogical practice. The use of these technologies cannot be confused with the sense of educational technologies of technicist conception.

Given the above, ignoring the inclusion of educational technologies in contemporary education is a disastrous setback. In fact, ignoring the presence of educational technologies would be tantamount to admitting scientific and educational setbacks. As for the insertion of educational technologies at school, there may still be some prejudice on the part of some teachers who are afraid to change their paradigms. In the current educational situation, there is

concepção, planejamento, coordenação e controle ficam a cargo de especialistas supostamente habilitados, neutros, objetivos, imparciais (SAVIANI, 2003, p. 13).

no possibility of avoiding the use of technologies in the educational system. Thus, it is up to teachers to overcome fear and distrust and insert the use of technologies as pedagogical resources in their teaching practice.

The innovative paradigm and technicality: convergences and divergences in the teacher's teaching practice

During the development of the research, it was possible to detect some convergences and divergences in the two approaches (the technician and the innovative). Convergences consist of the fact that both approaches make use of technologies. Although they differ as to the importance of their application, the first makes educational technologies pedagogical didactic resources that help the teacher in his professional activity, while the second believes that the mastery of technologies is the condition for professional formation.

Regarding the divergences, they reside in the fact that the innovative paradigm defends the integral formation of the student-being, that is, it is against Cartesian reductionism, whose tendency is to fragment knowledge. In the innovative paradigm, the teacher and the student are subjects of the teaching-learning process, as both aim to build knowledge. On the other hand, in technical pedagogy, knowledge happens in a fragmented way and in isolated parts, that is, the understanding of the whole depends on the understanding of the parts. In doing so, technician pedagogy leaves much to be desired, not least because everything is interconnected. For Cardoso (1995, p. 36), there is “interdependence between the various plans of personal, [...] community, social, planetary and cosmic totality. Everything that happens in one of the plans has repercussions in the others”²³.

With regard to scientific and technological advances and the constant transformations that the Brazilian educational system faces, they must be understood as a path of no return. This implies that the insertion of technologies in the educational field, in addition to being necessary, is inevitable. In view of the undeniable reality, the teacher must rethink his pedagogical practice, as contemporary education does not tolerate improvisation. The current moment instigates the subjects of the teaching-learning process to unveil the scenario of education, contextualize it and transform it into a broader social process, transforming it into the genesis and consolidation of the emerging movement of a new society understood by Castells (1999) as the knowledge society.

²³ “interdependência entre os vários planos de totalidade [...] pessoal, comunitária, social, planetário e cósmico. Tudo o que ocorre em um dos planos repercute nos demais”

More than chasing information and knowledge, the complexity of the demands imposed by the world of competitive work requires the teacher to have a cohesive and secure preparation, which allows him to understand the meaning of things based on the understanding of the whole and not of the isolated parts. Here is an apparently simple question, but one of extreme value for the construction of knowledge. It is valuable because it seeks to situate knowledge beyond the apparent objectivity of information. It is, therefore, an epistemological question: more than knowing, it implies thinking about knowledge.

With the advent of technologies in education, that is, from the 1980s onwards, the most critical thinking takes on pedagogical debates, demanding the contextualization of education with social issues and their contradictions, seeking the integral development of thinking subjects and their insertion critical in the world. It is not enough to use technology, but it is necessary to innovate pedagogical practice, the great challenge for the school to build a pedagogical project that allows the formation of full citizens. The technologies will be inserted in this project as a way to provide teachers and students with a deep relationship with knowledge, this is because when working with technologies, in a critical way, the teacher creates conditions for students to be able to deal with the technologies of society, appropriating them as subjects (LEITE, 2003).

Thus, inserting educational technologies in the pedagogical process from an innovative paradigm awakens the teacher to innovate his teaching practice, maintaining a balance in the use of technologies. We are talking about the use of technologies as teaching material in a critical and reflective way. Under these conditions, the educational paradigm encourages the teacher to seek innovations in pedagogical action, in the sense of proposing methodologies that lead to the production of knowledge, overcoming mere reproduction and, consequently, forming professionals who will act as critical and creative citizens. In this way, the innovative teaching paradigm bets on the fusion of learning styles, on the plurality of methods, on the diversity of activities that foster reflection, in the pedagogical environments that favor the interaction between the participants of the teaching-learning process.

In short, at the current juncture, it must be admitted that the use of educational technologies in pedagogical practice cannot be understood as an end in itself. On the contrary, use them as didactic resources that help the teacher in his pedagogical work. The danger lies when such technologies are transformed into an end in themselves, accentuating Cartesian reductionism centered on rationality, leaving aside emotions, that is, making man a divisible being. The teacher, when adopting educational technologies as pedagogical resources,

transforms his pedagogical practice in learning to learn, because the use of technologies becomes a challenge that instigates the teacher to constantly update.

Final considerations

The elaboration of this article caused us some discomfort, as we were faced with a professional provocation. We were emulated to rethink our teaching pedagogical practice in a world of constant and abrupt changes. The discussion on the theme impacted us, as it instigated us to review our teaching paradigms. At each stage of its elaboration, we found ourselves forged to strip off the old pedagogical guise, an inheritance that came from banking education, an education that for many years hindered our freedom and intellectual rebellion, reducing us to mere depositories of information from teachers. By restricting creative freedom to us, this educational system of education fragmented our knowledge.

Furthermore, the elaboration of the research solved our doubts, as well as facilitated the understanding regarding the insertion of technologies in contemporary education, since their presence in education is a practically irreversible process. Therefore, the teacher must make the effort to get to know them and insert them in their teaching practice as potential pedagogical resources of the teaching process.

Once the analysis has been done, it can be said that, in the current educational situation, changing paradigms is possible and is necessary, provided it is done with criteria, allowing the subjects involved (educators and students) commitment and participation. However, it is worth mentioning that abrupt changes are not recommended. Cohesive and safe changes are required and they can only happen consciously and without precipitations driven by threats or professional irresponsibility.

Responsible changes are needed to encourage the teacher to remove himself from the conservative teaching paradigms, whose emphasis is on the fragmentation of knowledge, in search of a pedagogical teaching practice that contemplates the integral formation of man. Finally, the discussion on the theme is not limited to this study, but the elements analyzed here give future researchers subsidies to continue their studies, allowing the material academy for new debates.

REFERENCES

BEHRENS, M.; OLIARI, A. A evolução dos paradigmas na educação: do pensamento científico tradicional à complexidade. **Revista Diálogo Educacional**, Curitiba, v. 7, n. 22, p. 53-66, set./dez. 2007.

- BEHRENS, M.; OLIARI, A. **O paradigma emergente e a prática pedagógica**. Petrópolis, Rio de Janeiro: Vozes, 2005.
- CAPRA, F. **A teia da vida**: uma nova compreensão científica dos sistemas vivos. São Paulo: Cultrix, 1996.
- CARDOSO, C. **A canção da inteireza**: uma visão holística da educação. São Paulo: Sammus, 1995.
- DEWEY, J. **Democracia e educação**: introdução à filosofia da educação. São Paulo: Companhia Editora Nacional, 1959.
- FREIRE, P. **Pedagogia do oprimido**. Rio de Janeiro: Paz e Terra, 2005.
- GHEDIN, E. Professor reflexivo: da alienação da técnica à autonomia crítica. *In: Professor reflexivo no Brasil*. São Paulo: Cortez, 2002.
- LEITE, L. *et al.* **Tecnologia educacional**: descubra suas possibilidades na sala de aula. Petrópolis, Rio de Janeiro: Vozes, 2003.
- MORIN, E. **Os sete saberes necessários à educação do futuro**. São Paulo: Cortez, 2004.
- KUENZER, A. Z.; MACHADO, L. R. de S. A pedagogia tecnicista. *In: MELLO, G. N. (Org.). Escola, tecnicismo e educação compensatória*. São Paulo: Loyola, 1982.
- OLIVEIRA, C. **Ambientes informatizados de aprendizagem**: produção e avaliação de software educativo. Campinas: Papirus, 2001.
- PERRENOUD, P. **Práticas Pedagógicas, Profissão docente e Formação**. Perspectivas Sociológicas. Lisboa: Publicações. 1993.
- SÁ-FILHO, C.; MACHADO, E. de C. **O computador como agente transformador da educação e o papel do objeto de aprendizagem**. Available: <http://www.abed.org.br/seminario2003/texto11.htm>. Access: 28 June 2019.
- SAMPAIO, M. N., LEITE, L. S. **Alfabetização tecnológica do professor**. Petrópolis: Vozes, 2008.
- SAVIANI, D. **Escola e democracia**. Campinas: Autores Associados Cortez, 2003.
- SAVIANI, D., DUARTE, N. A formação humana na perspectiva histórico-ontológica. **Revista Brasileira de Educação**, Rio de Janeiro, v. 15, n. 45, p. 422-433, set./dez. 2010.
- TESCAROLO, R.; GASQUE, K. C. G. D. Complexidade, currículo e ética: o parto de um novo mundo. **Revista Diálogo Educacional**, Curitiba, v. 7, n. 22, p. 39-52, set./dez. 2007.
- VASCONCELLOS, M. **Pensamento sistêmico**: novo paradigma da ciência. Campinas: Papirus, 2002.

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