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PLANNING OF A DIDACTIC SEQUENCE IN THE PERSPECTIVE OF INTEGRATED TRAINING AND THE CONSTRUCTION OF KNOWLEDGE BY CONSTELLATION OF THEODOR ADORNO

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ABSTRACT: The teaching of philosophy requires a performance, by teachers and students, that allows going beyond the simple phenomenal description of reality or knowledge. Admitting to aim at developing criticism as the foundation of human thought, it is essential to move beyond a simplistic reflection on the questions that surround our reality, in a way that makes it possible for philosophy, based on a careful reflection practice, to contribute to the unveiling of the entirety of the real. In this sense, this study intends to present the structure and application of a Didactic Sequence entitled “Thinking science constellation: a didactic sequence”, in order to introduce a teaching strategy that provides teachers with a way of teaching philosophy beyond the descriptive perspective of knowledge. We chose to organize the Didactic Sequence based on the concepts of comprehensive Education in the Vocational and Technological fields (EPT), interacting with the construction of knowledge by constellation (ADORNO, 2009). The Didactic Sequence intended to develop reflection and the construction of new knowledge by constellation to provide, during its application, moments and spaces of reflective and critical attitude, the development of knowledge and intellectual autonomy, and the understanding of social reality. The purpose of the study has been met, since the development of activities allowed to highlight and develop important terms such as science, common sense, scientific method, the scientific community, social responsibility, and cognitive, ethical, and political values.

Keywords: Professional and Technological Education, Didactic Sequence, Theodor Adorno, Integrated High School.

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PLANEJAMENTO DE UMA SEQUÊNCIA DIDÁTICA NA PERSPECTIVA DA FORMAÇÃO INTEGRADA E DA CONSTRUÇÃO DO CONHECIMENTO POR CONSTELAÇÃO DE THEODOR ADORNO

RESUMO: O ensino de filosofia requer uma atuação docente e discente que permite ir além da simples descrição fenomênica da realidade ou do conhecimento. Admitindo seu objetivo de desenvolver a crítica como fundamento do pensamento humano, é necessário avançar para além de uma reflexão simplória acerca dos questionamentos que rondam nossa realidade no sentido de possibilitar que a filosofia, alicerçada no exercício da reflexão criteriosa, possa contribuir para o desvelamento da totalidade do real. Nesse sentido, este trabalho tem por objetivo apresentar a organização e a aplicação de uma Sequência Didática intitulada “Pensar a constelação da ciência: uma Sequência Didática”, no intuito de apontar uma estratégia de ensino que oportunize aos docentes uma forma de ensinar filosofia para além da perspectiva descritiva do conhecimento. Optou-se por organizar a Sequência Didática tendo como base teórica as concepções de formação integrada na Educação Profissional e Tecnológica (EPT), em diálogo com a construção do conhecimento por constelação (ADORNO, 2009). A Sequência Didática buscou desenvolver a reflexão e a construção de novos conhecimentos por constelação com o objetivo de possibilitar, durante sua aplicação, momentos e espaços de atitude reflexiva e crítica, a produção de conhecimentos, o desenvolvimento da autonomia intelectual e a compreensão da realidade social. O objetivo deste trabalho foi atingido, uma vez que o desenvolvimento das atividades nos permitiu destacar e desenvolver termos importantes, tais como: ciência, senso comum, método científico, comunidade científica, responsabilidade social e valores cognitivos, éticos e políticos.

Palavras-chave: Educação Profissional e Tecnológica, Sequência Didática, Theodor Adorno, Ensino Médio Integrado.

PLANIFICACIÓN DE UNA SECUENCIA DIDÁCTICA EN LA PERSPECTIVA DE LA FORMACIÓN INTEGRADA Y LA CONSTRUCCIÓN DEL CONOCIMIENTO POR CONSTELACIÓN DE THEODOR ADORNO

RESÚMEN: La enseñanza de la filosofía requiere una actuación docente y discente que nos permita ir más allá de la simple descripción fenoménica de la realidad o del conocimiento. Admitiendo su objetivo de desarrollar la crítica como la base del pensamiento humano, es necesario ir más allá de una simple reflexión sobre las preguntas que rodean nuestra realidad, a fin de permitir que la filosofía, basada en el ejercicio de una reflexión cuidadosa, contribuya a la revelación de la totalidad de lo real. En este sentido, este trabajo tiene como objetivo presentar la organización y la aplicación de una Secuencia Didáctica titulada “Pensar la constelación de la ciencia: una secuencia didáctica”, para señalar una estrategia de enseñanza que brinde a los maestros una forma de enseñar filosofía más allá de la perspectiva descriptiva del conocimiento. Elegimos organizar la Secuencia Didáctica basada en los conceptos teóricos de la formación integrada en Educación Vocacional y Tecnológica (EPT) en diálogo con la construcción del conocimiento por constelación (ADORNO, 2009). La secuencia didáctica buscó desarrollar la reflexión y la construcción de nuevos conocimientos por constelación con el objetivo de permitir durante su aplicación momentos y espacios de actitud reflexiva y crítica, la producción de conocimiento, el desarrollo de la autonomía intelectual y la comprensión de la realidad social. El objetivo del trabajo se logró, ya que el desarrollo de las actividades permitió resaltar y desarrollar términos importantes como ciencia, sentido común, método científico, comunidad científica, responsabilidad social y valores cognitivos, éticos y políticos.

Palabras clave: Educación Profesional y Tecnológica, Secuencia Didáctica, Theodor Adorno, Escuela Secundaria Integrada.

INTRODUCTION

The Federal Institutes of Education, Science and Technology were created in 2008 – Law 11,892, of December 29, 2008 – from the existing structure of Cefets (*Centros Federais de Educação Tecnológica*) and Federal Technical Schools, Agrotechnical Schools and linked to Federal Universities. Some of the objectives of these institutions are the work in initial training, in secondary education integrated with professional training, in undergraduate courses, preferably technological, and graduate courses. Also, they aim to the encouragement and support educational processes that lead to the generation of work and income and citizen emancipation from the perspective of local and regional socio-economic development (BRASIL, 2008).

The conception of education of the institutions proposes an integrated education, through the integration of general humanistic, scientific, and professional training, considering training for the world of work as an alternative to restrictive training for the job market. Also presented as integral human formation, this integration seeks to overcome the division between those who think and those who work, between intellectual work and manual work. This division, according to Saviani (2007), historically followed the educational processes, becoming more effective and systematized after the Industrial Revolution. According to Saviani (2007, p. 159), the “referred separation had a double manifestation: the dualist proposal of professional schools for workers and science and humanities schools for future leaders”.

Omnilateral human training integrates work, science, and culture. Humanistic education should be configured as an inseparable part of technical and technological education at all levels and places where training for work takes place. According to Pacheco (2015, p. 32), “it is not a matter of ignoring the dimension of work as an economic practice aimed at the survival of man and the production of wealth, but of understanding it in its ontological dimension and as a social practice”.

The analyzes and diagnoses identified in these readings show that education, in particular Vocational and Technological Education (VTE), still has a structural duality and a linkage of training programs and objectives to an economic logic that makes training integrality and human emancipation difficult. A Didactic Sequence (DS) was applied in philosophy to fulfill the requirement of developing an educational product, to develop the themes of science, technology, and values.

Starting from the point that training for the world of work has not guided teaching practices at VTE, we seek, from the proposal of the Didactic Sequence, in a socio-interactionist perspective (VYGOTSKI, 2000), to indicate a path that, anchored in the conception of critique and emancipation, question and promote the overcoming of professional training as a simple confirmation to the dictates of capitalist society and the job market. For this, the DS activities were organized based on the idea of building knowledge by constellation, by philosopher Theodor Adorno.

The intention is to register the correspondence between the conceptions of emancipation and autonomy proposed by Critical Theory and the conceptions of integrated formation, emphasizing that the pedagogical processes oriented towards the apprehension of the concrete reality (KOSIK, 2002) or the constellation in which knowledge is found (ADORNO, 2009) contribute to the training for the world of work, making a scientific-technological and historical-social training coincide, in an articulated and integrated way. This allows the student to understand the technical, social, cultural, and politics of the current productive system (RAMOS, FRIGOTTO, CIAVATTA, 2012).

THE CRITICAL THEORY

In this section, we present a brief description of Critical Theory, based on the conception of the Frankfurt School, intending to support the understanding of Theodor Adorno's idea of construction of knowledge by constellation. We propose a reading of Critical Theory as a method to elaborate a didactic proposal aimed at achieving training for the world of work and the autonomy and emancipation of the individuals involved in the educational processes.

In the works of authors such as Max Horkheimer and Theodor Adorno (*Dialectics of Enlightenment, Traditional Theory and Critical Theory, Negative Dialectics*, among others), Critical Theory turns

to the analysis of reason which, far from fulfilling its function of promoting autonomy and freedom, along the lines of the Enlightenment, is an instrument of domination.

Adorno and Horkheimer, with this, repudiate the denial of this liberating potential of the Enlightenment project. They emphasize that the reason that had arisen as a promoter of freedom is instrumentalized, moves away from its original project, transforming into instrumental reason and the path that humanity treads given the domination of nature and man. (SILVA, 2010, p. 10).

The purpose of Critical Theory is to review its rationality, in the sense of recovering the meaning of emancipation. This theory proposes to investigate and question about life to which individuals are submitted, seeking to understand how rationality (enlightenment), which, in principle, should confirm humanity as the guide of its history, is taken by “darkness” of the instrumental reason. As Adorno and Horkheimer (1985, p. 11) warn, “humanity, instead of entering a truly human state, is sinking into a new kind of barbarism”.

Based on the evidence of the instrumentalization of reason and dehumanization, Critical Theory proposes a (re)evaluation of the achievements of reason, while revealing a project of emancipation, opposing the degrading domination of nature and man in any measure. Critical Theory aims to think for oneself, as a requirement for the man's autonomy, approaching the Enlightenment program, as it understands reason as the foundation for emancipation.

However, this same reason that is a promoter of freedom, in the historical, material, and social process, is instrumentalized, distancing from the original purpose, transforming into what the Frankfurtian authors called instrumental reason. This instrumental reason starts to indicate the direction in which humanity is treading, in its attempt to dominate nature and man.

Critical Theory is characterized by the attempt to recover the reason that used to base freedom, but which is now entangled in the intricacies and mechanisms of domination, subordinating as a mere instrument of it. For Adorno and Horkheimer (1985), when instrumentalizing, reason moves away from its primordial foundation: emancipation. Hence the realization by these authors of the imminence of a “new kind of barbarism”.

In this sense, Critical Theory aims to rethink rationality, with the intention of re-approaching the meaning of “being guided by reason” as a condition for emancipation. For such an undertaking, it is suspicion about the circumstances and conditions to which men are submitted and has as its horizon an emancipatory project, based on the freedom conquered in the exercise of enlightened thinking.

This emancipatory project is proposed by Adorno and Horkheimer (1985) based on the observation that the view one has of reality is tainted by falsehoods, arising from mechanisms and strategies that prevent the true recognition and apprehension of facts and their conditioning. This blurred vision prevents the formation of individual and collective consciousness, which should be based on critical and reliable findings of reality.

A critical analysis of reality allows the emergence of themes that, otherwise, would be hidden. A classic example of these themes is the cultural industry, which, when producing and distributing cultural goods, manifests a great power of control over our ability to critically evaluate the structures and mechanisms that guide and determine society.

The violence of industrial society settled in men once and for all. The products of the culture industry can be sure that even the distracted will openly consume them. Each one is a model of the gigantic economic machinery that, from the beginning, gives no one a break, both at work and at rest, which is so similar to work. (ADORNO; HORKHEIMER, 1985, p. 61).

With this, we understand Critical Theory as a tool of social criticism that is based on facing reality, seeking the apparent reasons and those that underlie the social phenomenon. In this way, Critical Theory is an attempt to identify and oppose instrumentalized reason and administered society, both understood as departures from the emancipatory condition of reason.

Critical Theory has, over time, assumed several meanings. In general, this denomination includes theories that oppose the established order, positivism, and that, in one way or another, intended to build a more just society. In this work, when we mention Critical Theory, we refer to a group of

German thinkers from the 1920s, unorthodox Marxists, who politically and intellectually influenced academic debates and the public sphere of their time and later historical periods, from two generations that followed the group that gave rise to the Frankfurt School. In this context, what meaning can the expression Critical Theory have? In the understanding of Gomes (2010, p. 287-288), it is

[...] an expression that designates at least three different meanings: a theoretical field, a specific group of intellectuals from the Frankfurt Institute for Social Research affiliated with this theoretical field, and the Frankfurt School. Regardless of the meaning that can be attributed to the Critical Theory of Society, the classic meaning of the concept of Critical Theory, as used by Horkheimer in 1937, highlights the two fundamental principles that demarcate a specific theoretical field: the orientation towards emancipation and the critical behavior.

Within the scope of the Frankfurt School, Max Horkheimer's essay, *Traditional Theory and Critical Theory* lays the epistemological foundations of what would be a critical approach to the study of society. The work focuses on the understanding of reality from what the author characterizes as “critical behavior”. Initially, Horkheimer (1975, p. 129) identifies the emergence of Traditional Theory, which operates

[...] with conditioned propositions, applied to a given situation. Assuming circumstances a, b, c and d, one must expect the occurrence q; when p disappears, the occurrence r is expected, coming g, then the occurrence s, and so on. This calculation belongs to the logical framework of history as well as to that of natural science. It is the mode of existence of theory in the traditional sense.

Thus, the validity of this theory depends on whether the predictions turn out to be correct or not.

With this, the scientist is the one who observes the phenomena and establishes objective connections between them, that is, connections that occur in nature independently of any intervention on their part. To do so, he has to abstract from the qualities of objects and the meaning they may have in the context of social relations, to consider them solely as elements of a necessary causal chain. (NOBRE, 2011, p. 35).

According to Traditional Theory, it is up to the scientist to classify and explain the object of study according to the neutral criteria of the method, exempting from any subjective appreciation. The *raison d'être* of the Traditional Theory points to the need for an impartial observer, along the lines of the natural sciences, so that, without the interference of the observer, it is possible to produce results linked, as close as possible, to the object studied. This theory would not aim at action, but only at the presentation of the connections between social phenomena, without the interference of the scientist's conception of the world or values.

According to Horkheimer (1975, p. 164), the

[...] the formulation of theories in the traditional sense constitutes a profession in a given society, delimited by other scientific activities and so on, and need not be concerned with knowing either the trends or the historical goals in which these theories are intertwined. Critical theory, on the other hand, in the formation of its categories and all phases of its development, consciously follows the interest in a rational organization of human activity: clarifying and legitimizing this interest is the task it assigns to itself.

As a model of scientific theory, Traditional Theory brought a series of consequences for the analysis of reality: the separation between individual and society, the partial perspective of class, simplification, and elimination of contradictions in social praxis (CARNAÚBA, 2010). Due to intended scientific neutrality, this theory privileges the description of the functioning of society and the conformation of thought to reality.

This idea of conformation or adaptation is also analyzed by Nobre (2011, p. 38):

The traditional perspective of theory, intending simply to explain the functioning of society, ends up adapting thought to reality. In the name of alleged neutrality of description, Traditional Theory resigns to the historical form present in domination.

The limits of Traditional Theory are identified when it ignores the historical conditions of social reality, hindering the know the real connections of social phenomena. For Horkheimer (1975, p. 153), “the social genesis of problems, the real situations in which science is used and the ends pursued in its application, are by itself considered external”. The identification of these historical conditions is one of the tasks to which Critical Theory proposes itself.

Critical theory of society, on the contrary, has as its object men as producers of all their historical forms of life. Actual situations, on which science is based, are not for it, a given thing, whose only problem would be the mere observation and prediction according to the laws of probability. What is given depends not only on nature but also on man's power over it. The objects and the kind of perception, the formulation of questions, and the meaning of the answer give evidence of human activity and the degree of its power. (HORKHEIMER, 1975, p. 153).

Critical Theory considers the dialectic of social relations and presents, critically, “things as they are” and “as they could be”, as a result of the identification and reflection on the potentialities and obstacles to emancipation (GOMES, 2010).

According to Rush (2008, p. 35), Critical Theory

[...] is not merely descriptive, it is a way of instigating social change, providing knowledge of the forces of social inequality that can guide political action aimed at emancipation (or, at the very least, reduction of domination and inequality). Following this line of thought, one might think that Critical Theory is “critical” only insofar as it makes social inequality apparent, points out some plausible candidates for the causes of inequality, and allows society at large (or at least to the oppressed segment) react appropriately.

Critical behavior and the orientation towards emancipation are the principles that characterize Critical Theory and constitute an intellectual method or tradition since the foundation of the Institute for Social Research, or Frankfurt School, as it is also called. According to Nobre (2011, p. 33-34), “theory is responsible for examining the existing not simply to describe it, but to identify and analyze each time the obstacles and possibilities of emancipation present in each historical moment”. Critical behavior and orientation towards emancipation enable us to envision the development of an emancipated society from the current social organization.

Since Marx, the function of Critical Theory is to contribute to the formulation of a diagnosis of time. According to Melo (2011, p. 249), the challenge of this theory

[...] it consists in being able to renew its diagnoses to enable us to continue formulating a perspective from which the obstacles to emancipation or emancipatory potentials, when present in a given society, are considered and analyzed critically. What are the most appropriate categories and diagnoses today to carry this tradition of thought forward?

The option for Critical Theory, in the conception engendered by the Frankfurt School, is an alternative to think about education from a critical perspective, necessary to, when proceeding with the recent diagnosis of Vocational and Technological Education, envision a training project for social emancipation. With this in mind, we propose, based on the idea and course of emancipation, to apply the critique of instrumental rationality, rescuing human autonomy and freedom within the context of the VTE. The intention is to promote the formation of a citizen for the world of work, with conditions to face the problems and economic, political, and cultural challenges of the society.

What we seek to extract from the Critical Theory method for planning a Didactic Sequence is precisely the critical behavior, the idea of diagnosis of time and emancipation, from which the following question emerges: the teaching plans of the philosophy subject, in the courses already mentioned, do they translate training into the world of work, or do they still reverberate training into the labor market?

Integrated Education

The Federal Institutes (FIs) were presented as an advance in the educational, social, and economic sphere, by placing equity and social justice as objectives of their performance; professional training based on scientific and technological knowledge in line with local production arrangements; economic competitiveness; and the integral development of the student and the worker. As indicated by Alves, Placido, Faria and Rohr (2019, p. 569), the

[...] pedagogical proposal in the FIs seeks to articulate work, science, and culture in the perspective of human emancipation. In this way, its pedagogical orientation refuses ready knowledge, based merely on textbooks, seeking a more comprehensive and flexible professional training, with less emphasis on training for mechanical work and more on understanding the world of work and on qualitatively superior participation. It is about a broader professionalization, which opens up infinite possibilities to reinvent in the world and for the world. Principles that are valid and useful for any field of training.

Of the principles that govern the foundation of these institutions, we highlight the one that proposes integral and citizen training, confirming the intention to undertake a progressive project of education in the sense of social transformation. The proposal for professional and technological education of the Federal Institutes is based on the idea of integrated training, long before the simple qualification for work.

In this context, the Federal Institute points to a new type of institution identified and committed to the project of society underway in the country. Therefore, it represents a qualitative leap in a singular journey, on the verge of completing one hundred years. It is a progressive project that understands education as a commitment to transform and enrich objective knowledge capable of modifying social life and giving it greater meaning and scope in the whole of human experience, a proposal incompatible with a conservative vision of society. Thus, it is a strategy of political action and social transformation. (BRASIL, 2008, p. 21).

The questions regarding Vocational and Technological Education come mainly from the technician and fragmented way in which it has been thought and implemented over time in Brazil, in contradiction to what was advocated when the Federal Institutes were idealized and implemented. Historically organized to meet the objectives of the ruling class and the economic system, the VTE has been guided, as a priority, in the qualification of labor, according to the demands of the labor market.

The intention is to overcome the Althusserian vision of the school institution as a mere ideological apparatus of the State, reproducing the values of the ruling class and reflecting within it the contradictory interests of a class society. The Federal Institutes reserve to the protagonists of the educational process, and the undeniable role of dealing with scientific-technological knowledge, a praxis that reveals the places occupied by each individual in the social fabric, which brings to light the different ideological conceptions and assures the subjects the conditions to interpret this society and exercise its citizenship from the perspective of a country founded on justice, equity and solidarity. (BRASIL, 2008, p. 21).

The integration that makes up the proposal for Integrated Secondary Education of the Federal Institutes reveals a conception of human training in which the incorporation of the different dimensions of life in the educational process is proposed, having as a horizon the omnilateral formation of the individuals. These dimensions are: work, science, and culture, translated as follows:

Work is understood as a human achievement inherent to being (ontological meaning) and as an economic practice (historical meaning associated with the mode of production); science understood as the knowledge produced by humanity that enables the contradictory advance of productive forces; and culture, which corresponds to the ethical and aesthetic values that guide the norms of conduct of a society. (BRASIL, 2007, p. 40-41).

The expression “integrated education” is taken here in the sense of completeness, of “understanding the parts as a whole or of the unity in the diverse, of treating education as a social unit,

that is, in the multiple historical mediations that materialize the processes educational” (RAMOS; FRIGOTTO; CIAVATTA, 2012, p. 84). In this general sense, propaedeutic education must become an inseparable part of professional education, overcoming the dichotomy between manual work and intellectual work and of training workers capable of acting as leaders and citizens, based on the integration of the intellectual dimension to productive work. We expect that integrated education can contribute to overcoming the social division of work, in which some have the function of thinking, directing, or planning, while others are required to have reductive training for work, in its only operational aspect.

As a human formation, what is sought is to guarantee the adolescent, young person, and adult worker the right to a complete formation to read the world and to act as a citizen belonging to a country, worthily integrated into its political society. Training, which in this sense, presupposes the understanding of the social relations underlying all phenomena. (RAMOS; FRIGOTTO; CIAVATTA, 2012, p. 85).

From the idea of integrated training, the criticisms made to the maintenance of the centrality of education in the economic dimension are justified, and the aim is to overcome the acceptance of the market as the only regulator of human sociability. What is intended is that human beings, with their relationships with nature, assume the centrality of training, meeting the needs of individuals and society.

When analyzing the proposals for the guidelines for technical professional education at the secondary level, we observe that the text we refer to here, “the place of Brazilian society in the international division of labor”, highlights another important point (BRASIL, 2010, p. 8). It puts Brazil as a country dependent on the organic core of capital and target of interference by international organizations' guidelines in the elaboration of guiding documents for professional education, especially in the adoption of the pedagogy of competences to meet the demands of the labor market; labor relationships, aiming at flexibility and deregulation; and modernization, contrasting with the lack of an effective fight against the growth of poverty (BRASIL, 2010).

Focusing on the productivist conception, it deviates from the recurring problem of socialization and distribution of material and social goods that can guarantee everyone a dignified life and a future perspective for young people (BRASIL, 2010).

The perspective of a VTE that contemplates the autonomy of the individual, in many cases, does not reflect the practice of the classroom, where what is taught. many times, they are just contents and procedures for conformation to the job market. And even if, faced with the need to respond to the urgency of innovation and “technological conversion” to which the productive sectors are obliged, training takes place through the increase of knowledge of work processes, not being restricted to training to perform a specific task, these contents and procedures do not go beyond those that, quantitatively and qualitatively, meet the demands of capital (FRIGOTTO, 2010, p. 189). The emancipatory leap is hampered by the hegemonic interests of a dominant capitalist class. For Frigotto (2010, p. 189), “the challenge is, in the contradictory form of capital, to expand the possibilities of a 'unitary' technological formation for all”.

From the point of view of Critical Theory, this context is also a fertile field to undertake a broad analysis of what is happening in society and, in particular, in the VTE, which is found in the context of capitalism. For that reason, it is limited to the ability to adapt to pre-established purposes and results, or even to the ability to assess which are the best resources or instruments to achieve objectives that are beyond their domain.

Historically, the great project of emancipation of human reason has always been placed in the rational determination of ends, that is, in the debate and the performance of those values considered beautiful, fair, and true. In managed capitalism, the reason is reduced to a capacity to adapt to previously given ends of calculating the best means to achieve ends that are foreign to it. This rationality is dominant in society not only because it shapes the economy, the political system, or the state bureaucracy, it is also part of socialization, the learning process, and personality formation. (NOBRE, 2011, p. 51).

The analysis to be carried out starts from the following questions: to what extent does the “learning process” developed in the Federal Institutes reflect this administered and instrumental rationality imposed by the capitalist system? Is it possible to find, in the proposed implementation, expansion, and development of FIs, intentions, and strategies that oppose this conformative vision of training/education? What are the untapped opportunities? How can Critical Theory guide a training process that aims at the world of work and emancipation?

We understand as a formation for the labor market which is organized around the objective of training and adapting to the demands of the labor market, forming individuals to passively submit to the process of market competitiveness. On the other hand, training for the world of work comprises a training process capable of meeting the requirements of changes in the technical basis of production and development of a worker with conditions to understand and fight for their emancipation. In these terms, training for the world of work approaches the proposal of Ramos, Frigotto, and Ciavatta (2012), which is to make a scientific-technological and historical-social training coincide, in an articulated and integrated way, that allows the student to an understanding of the technical, social, cultural and political foundations of the current production system.

In this way, the subject of education, the one who leads the educational processes, is the man considered in his entirety, that is, the one who understands his historical and varied needs, such as material, biological, affective, aesthetic, and playful. In this sense, the proposition of training for the world of work requires the struggle for human qualification to consider man in his various dimensions.

That human qualification is not subordinated to the laws of the market and its adaptability and functionality, whether in the form of training and narrow training in the image of the domesticated mono of Taylorist schemes or the form of polyvalence and abstract training, general training, or polycognition demanded by modern businessmen (Veblen, 1918) and the organizations that represent them. (FRIGOTTO, 2010, p. 34).

By considering work as an educational principle, since it is the fundamental principle of all human becoming, Frigotto (2010) admits that human qualification, undertaken from the development of the omnilateral conditions of the human being (all dimensions), meets a properly human condition, and this same condition is attacked when the human training is commodified, since this figure among the rights of man, that is, to expand his capacity to work in the production of use-values that meet his multiple needs.

We should mention that the literature that proposes to present and discuss the relationship between educational practices and the interests of capital highlights that, historically, there is a subordination of those practices in these interests, showing that such subordination is revealed by the formative duality: training for the ruling classes and another for the working class, carried out through a disciplinary and training school. The counterpoint to this situation is assumed by those who, based on the ideas of Marx and Engels, seek to be guided by an omnilateral conception of education and human qualification based on the perspective of establishing new social relationships within a new society (FRIGOTTO, 2010).

Given the above, we identified the intended conceptions of an ideal educational space (opportunities) for the training of a young person for the world of work. However, the non-confirmation of the predictions of the VTE guidelines shows the need to reflect on the didactic and training processes, and the Didactic Sequence is an example, as a way of acting in favor of emancipatory training.

Proposal for a Didactic Sequence

In the face of the condition of the possibility of freeing man from his “Kantian minority”, Adorno understands education, not as “modeling people”, nor as a mere transmission of knowledge, but as the production of a true conscience (ADORNO, 1995).

Based on this understanding, we organized a proposal for a Didactic Sequence, understood here as an “ordered and articulated series of activities that form the didactic units” (ZABALA, 1998, p. 53), for philosophy, having as reference the production of knowledge by constellation, by Theodor Adorno. This idea contributed to the proposition and organization of the Didactic Sequence and can be

taken as an instrument to be used by teachers to help plan, conduct, and evaluate classes. This proposal was a pedagogical experience in which learning and development would no longer be based on the direct action of the subject on the object, but on an activity mediated by the other, to create opportunities for pedagogical mediation in dialogue with a social interactionist perspective (VYGOTSKY, 2007).

In this type of mediation, the teacher assumes a privileged role in learning, since he/she moves from the action of the mere transmitter to the action of mediator and motivator of the process, appropriating pedagogical practices that provide opportunities for student learning and that these assume the role of knowledge builders (PLACIDO; DE LUCA; SOUZA, 2018). In the words of Placido, Schon, and Souza (2017, p. 44), it is important to “emphasize that teaching-learning strategies occur through the relationship between teacher and student, considering all the variables involved”.

The Didactic Sequence was designed, at first, for a group concluding the Integrated High School Course in Mechanics, at a Federal Institute. However, we understand that this material can guide the organization of activities on different topics and for other groups of students. The intention is to indicate a path that, anchored in the conception of criticism and emancipation, questions and overcomes the simple description of contents and, more broadly, contributes to overcoming the conformation to the dictates of the managed capitalist society and the labor market.

Starting from the wide range of Philosophy of Science, we delimited the content and activities of this Didactic Sequence to the themes of science, technology, and values. The objective is to develop reflections and broaden the understanding of concepts, such as science, technology, and values, studied through research, debate, and the construction of knowledge through constellations. Based on the current role of science and technology, we propose the verification of social, political, economic, and cultural conditions, which contribute to the elucidation of the scientific and technological phenomenon, enabling the perception of implicit trends in this phenomenon, which, in some way, can be understood as possibilities of transforming the given reality.

Therefore, it is an opportunity to analyze and understand the contents (knowledge) beyond its initial phenomenal perception (synchysis), identifying the historical and social conditions, to reach the synthesis of the knowledge of the proposed theme.

Adorno (2009, p. 141-142), when explaining knowledge by constellation, indicates that perceiving

[...] the constellation in which the thing finds means the same thing as deciphering what it carries within itself as something that came to be. [...] Only a knowledge that bears in mind the conjunctural historical value of the object in its relationship with other objects manages to release history in the object; updating and concentrating on something already known that transforms knowledge.

Through the construction of constellations, the object gains visibility, articulates the activity of understanding with the principle of composition of this object, and “contemplates, at the same time, the object and its interrelations with the social reality in which it is inserted, freeing the concept of identity crystallization, in addition to enabling the existence of the non-conceptual, non-identical, which constitutes the constellation” (BANDEIRA; OLIVEIRA, 2014, p. 42).

To know the reality, it is necessary to know the determinants that contributed to the existence of such a reality. By elaborating a proposal for a Didactic Sequence with this bias, we intend to indicate a path that contributes to reflection and overcoming the problems discussed here.

Also, according to Araújo (2003, p. 323) “in a simple way and a direct response, didactic sequence (DS) is a way for the teacher to organize teaching activities according to thematic and procedural nuclei”. In this sense, a Didactic Sequence is a set of school activities organized in a systematic way on a theme. When we mention the Didactic Sequence as a pedagogical instrument for the educational formation of students, we are talking about a way of organizing the times and spaces of educational practice. According to Adorno (2009, p. 142), “the knowledge of the object in its constellation is the knowledge of the process that it accumulates in itself”.

The Didactic Sequence was developed in the Philosophy subject, in a class of module VI of the Technical Course in Mechanics, integrated to the High School of the Federal Institute of Santa Catarina (IFSC) - Campus Itajaí -, in which the themes science, technology and values, listed in the

contents of the mentioned subject, foreseen in the Pedagogical Project of the Course (PPC), for this module. In this way, we envision expanding the students' philosophical understanding of these themes, which permeate the context and social relationships over time and which become complex today, as they develop and manifest in different ways. The activities were developed from November 19, 2019, to December 10, 2019, distributed in four meetings, each with 110 minutes. During this period, Philosophy was taught in two consecutive periods of 55 minutes each, starting at 09:55 and ending at 11:45.

Below we present the Didactic Sequence, according to the content unit and the classes that were applied, as well as the objective and justification of each class.

Content unit - Philosophy of Science: science, technology, and values

The general objective of this content unit is to develop reflections on the Philosophy of Science and expand the understanding of the concepts studied (science, technology, and values) through research, debate, and the construction of knowledge through constellations.

As a justification, we have that this proposal of Didactic Sequence intends to contribute to the production of a diagnosis of time, starting from the current protagonism of science and technology and proposing the verification of the social, political, economic, and cultural conditions. This contributes to the elucidation of the scientific and technological phenomenon, enabling the perception of implicit trends in this phenomenon that, in some way, can be understood as possibilities for transforming the given reality.

We start from the idea that teaching is necessary that allows thinking and realizing that it is possible to create, that submission is not the only option. Teaching enables to think about the different and go beyond the phenomenal perception and ideological impositions, allowing the rupture with the versions of "truth" instituted and imposed by the various forms of power that are manifested in a dominating way. One of these forms of power is the technical and technological determinism that prevails at the same time, which is expressed in the objectivity of methods, in the measurement and training of flexible human beings, with skills that can adapt to the most diverse modes and productive times, compromising the development of critical thinking, here understood as the ability to diagnose reality, especially its political-social context, and identify possibilities and forms of action and resistance when this reality alienates or excludes.

Lesson 1 – “Do you know what science is?”

Objective: To verify the student's prior knowledge and resume the concept of science and its relationship with technology and values (cognitive, political, and ethical).

Activities:

1. Initially, images will be projected separately and, later, gathered in the form of a mosaic, so that, from them, students can verbally answer the following questions: what is science?; what is technology?; how do they relate to the idea of values? What would be the role of science and technology in human life? What is the relationship of students with these concepts in their daily lives? and questioning the reliability of scientific and technological knowledge and products.

Regarding the importance of verifying and considering what students already know about the proposed topic, Vasconcellos (1993, p. 48 apud GASPARIN, 2012, p. 15) considers the following:

Knowing the reality of the students implies making a mapping, a survey of the representations of the students' knowledge on the subject of study. Mobilization is the moment to request the vision/conception that students have about the object (common sense, “syncretism”).

Based on what students already know, it is possible to propose more appropriate activities so that, in later stages, they can appropriate knowledge that adds meaning to their lives. In a proposal for the construction of knowledge by constellation, this initial moment corresponds to the phenomenal perception of the object (science), which may be accompanied by a certain degree of criticality, depending on which relationships the student is already able to establish with the factors that contributed to the constitution of the object. In any case, considering the different levels of understanding, it is possible to bring out a first version of the constellation around the proposed theme, indicating which paths to take to expand it and get closer to Adorno's proposal, that of achieving a knowledge more reliable of the object through the “knowledge of the process that it accumulates in itself” (ADORNO, 2009, p. 142).

Lesson 2 – “How does science relate to other dimensions of life?”

Objective: To identify the relationships that science establishes with other dimensions of life (politics, culture, work, beliefs, social organization, economy, etc.) and critically reflect on the consequences of these relationships.

Activities:

1. To read the reference texts and, from them, select a set of images that illustrate the relationships and consequences of science (in groups).
2. To socialize images, information, and discussions about the text (in a group).
3. As a fixation activity, each student must submit a file, under the same conditions as the activity proposed in Lesson 1, containing the selected images (in mosaic form), a quote from the read text that best expresses the relationships and consequences of science and the writing of a text reporting the impressions on the text and the images.

Texts:

1. *A política da atividade científica e Colocando a ciência em seu devido lugar*⁹, both taken from the book *A fabricação da ciência*¹⁰, by Alan A. Chalmers, p. 157-160 and p. 160-162, respectively.
2. *A proliferação dos híbridos*¹¹, extracted from the book *Jamais fomos modernos*¹², by Bruno Latour, p. 7-11.
3. *Ciência desinteressada e utilitarismo*¹³ (p. 234), *O cientificismo e A ilusão da neutralidade da ciência*¹⁴ (p. 234-235), and *As condições atuais da pesquisa e os grandes interesses em jogo*¹⁵ (p. 236), extracted from the book *Convite à Filosofia*¹⁶, by Marilena Chauí.
4. *Ciência e valores*¹⁷, extracted from the book *Filosofando: introdução à filosofia*¹⁸, by Maria de Lucia Arruda Aranha and Maria Helena Pires Martins, p. 304-305.

Justification: in a society governed by scientific knowledge, the most diverse sectors of society and the different dimensions of life are permeated by science. From the organization

⁹ *The politics of scientific activity and Putting science in its place*

¹⁰ *Science and its Fabrication*

¹¹ *The proliferation of hybrids*

¹² *We were never modern*

¹³ *Disinterested Science and Utilitarianism*

¹⁴ *Scientism and The Illusion of the Neutrality of Science*

¹⁵ *The Current Conditions of Research and the Great Interests at Play*

¹⁶ *Invitation to Philosophy*

¹⁷ *Science and values*

¹⁸ *Philosophizing: Introduction to Philosophy*

of the world of work, culture, and knowledge, to individual desires and preferences, they are influenced by scientific knowledge and the instruments and objects that arise from it. Thus, if the intention is to make a diagnosis of time, to identify and critically analyze these relationships, this is an important step to go beyond the simple description of science and its technical and technological artifacts.

The intention of this activity is also to investigate the values, whether cognitive, political, or ethical, that permeate the methodological procedures of science and the purposes for which the applications of scientific discoveries are intended, the awareness and responsibility that this entails to scientists, governments and every citizen.

The changes in personal relationships and the constitution of the family, based on scientific and technological innovations related to human reproduction (contraceptives, artificial insemination, etc.), the alteration of rural and urban landscapes, leisure and production (new agricultural techniques, types of services and professions, etc.), are examples of the ramifications of the interference of science and technology over time and intensified in the present time. This is an opportunity to reflect on the scientifically determined society, which, although it manifests many negative marks in the present time, carries within itself possibilities for change.

Lesson 3 – “Frankfurt School: instrumental reason”

Objective: to know and reflect on the contributions of the Frankfurt School and Critical Theory to the critical understanding of science, based on the assimilation of the concept of Instrumental Reason.

Activities:

1. To give an oral presentation on the topic: “Instrumental Reason” (first part of the lesson).
2. From the understanding of the concept of instrumental reason, select images that illustrate the instrumentalization of reason (second part of the lesson).
3. To carry out a fixation Activity (individual text) based on the questions: how do you perceive yourself in the context of the production and use of knowledge (science) within the school? What is the concept of science and its purposes in the VTE school environment?

Texts:

1. *Do projeto emancipatório iluminista à razão instrumental: obstáculos para a efetivação da emancipação?*¹⁹ (extracted from the work *Educação, emancipação e barbárie*²⁰, by Danielton Campos Melonio, p. 51-56).
2. *A razão instrumental*²¹ (extracted from the work *Convite à Filosofia*²², by Marilena Chauí, p. 236-237).

Justification: the historical period known as the Enlightenment (18th century) developed the idea of progress and the liberation of men from all forms of obscurantism and superstition based on the predominance of reason and science. However, over time, what happened was the transformation of Enlightenment reason into instrumental reason, which, through the action of science and technology, proposes to act on nature, transforming it in an effective, productive, and competitive way. In other words, instrumental reason privileges the choice of means to achieve certain ends. It is formal, not being tied to content, principles, and ends. It is technicist, concerned with the production, without being properly concerned with the ethical principles of the purposes for which it is intended.

¹⁹ *From the Enlightenment emancipatory project to instrumental reason: obstacles to the realization of emancipation?*

²⁰ *Education, emancipation and barbarism*

²¹ *The Instrumental Reason*

²² *Invitation to Philosophy*

The Frankfurt School, during this historical context, made a critical analysis of the deviations of reason, demonstrating that instrumental reason did not lead to enlightenment, light, order, and progress. Enlightened reason has performed its opposite, that is, barbarism. (MELONIO, 2016, p. 54).

Reason becomes an instrument of ideological, scientific, and political domination. In this sense, it moves away from its continuous process of progress and well-being, as the Enlightenment thinkers imagined, and assumes a character of domination of nature and the human being, to promote, on several occasions, barbarism and not emancipation and freedom. Examples include world wars, destruction of the environment, alienation, exploitation, and human domination.

However, what happened to reason? What led modern reason, based on Science, to deviate from its emancipatory path? When did reason stop chasing the truth and started to seek domination? Or did modern reason never aim to reach such truth and, consequently, to free men from fear and superstition? (MELONIO, 2016, p. 55).

The Frankfurt School's counterpoint to instrumental reason was precisely the construction of a Critical Theory that broke and surpassed the limits of instrumental reason, to reveal the power relations built through knowledge and science. Therefore, a critical reason has the role of thinking and reflecting on the means and ends of knowledge.

With the students, the idea is to discuss whether instrumental reason and science are in fact ways of freeing us from oppression; and whether education, guided by this form of reason, is not also a way of perpetuating this oppression.

Remaining in the superficiality of the scientific phenomenon, considering only the result of scientific and technological knowledge, materialized in instruments and products, contributes to conforming to a reality that nullifies the individual, conditioning him to submission to instrumental reason, which determines social organization and policy to satisfy the demands of the prevailing economic system.

In this activity, we seek to reflect on the foundations, means, and ends of science, to reveal what underlies the predominance of this type of rationality, so that, from the awareness provided by the diagnosis of time, we can perceive the use of science much more to favor an exploitative and excluding economic system, than to effectively clarify and free the human being from true knowledge. The objective is to contribute to a broader view of science and an expansion of the critical sense in the face of reality as a condition for a more conscious action in the world of work. This activity also contributes to expanding the constellation that forms around the idea of science, when we seek to understand its foundations, purposes, interests, and consequences.

Lesson 4 – “Synthesis and evaluation (Expression of synthesis through the construction of a mosaic of images, video and dissertation text)”

Objective: to summarize the contents studied and assess the knowledge acquired.

Activity:

1. The lesson will organize a mosaic from the images selected in the previous activities, seeking to highlight the term science (placed in the center of the mosaic) and arranging the images to link with the central term, allowing visualization of the frame as a *constellation* (collective activity).
2. To produce a mosaic presentation video (maximum video time: 2 min.) (group activity).
3. Next, students will produce a text on the topic studied, highlighting the concepts studied, the relationships established between these concepts, and what, from the activities, it was possible to expand knowledge and understanding in the initial diagnostic activity, as well as the questions that persist on the subject (individual activity).

The discussions raised by the texts and the result of the activities showed that the students understood the proposed theme and realized the relations of science and scientific knowledge with their various conditioning and determinants, with emphasis on the relations between philosophy and science, established from the ideas of the philosophers and authors mentioned, between science and religion, science and politics, science and technology, considerations regarding the limits of science and the influence of ideological, political and economic interests that compromise the credibility, impartiality and ethical conditions of science. Students realized that scientific knowledge, or science itself, conveys credibility, being a knowledge believed by society, which, on the one hand, is a result of the scientific method used, but, on the other hand, makes people less critical in the sense that they no longer question knowledge.

The future of science, technology, and values were discussed. Topics such as the internet of things, the democratization of technological results, who organizes, finances, and directs science and technology were mentioned, about what interests and objectives are to be achieved, and future working and employment conditions. In addition, the debate addressed, among other topics, human cloning, drugs that end up creating dependence when used frequently, research funding, public investments in scientific education; and, at that moment, criticism arose regarding the structure of the “factory”, as the mechanic's laboratory is known, and of the campus laboratories – according to some students, these spaces are underused and have structures and equipment below what technology and scientific development already make it possible, even agreeing that, concerning the conditions of the campus, the reality of other schools is even further from the ideal.

The students also realized that the course in which they are enrolled fits this discussion since they learn science and technology, as well as principles and values - in the documents analyzed by the students -, so that, in their current and future practice (in a profession or continuity of studies), can interact with scientific and technological knowledge in an efficient, ethical and responsible manner.

The topics were discussed, and others, which could be included in the debate, demonstrated how extensive the constellation of science is, that is, the process that this discussed topic accumulates in itself as something that came to be and that continues to be transformed is broad, complex and needs reflection so that one can move from the simple description to the unveiling of the multiple determinations that constitute it.

FINAL CONSIDERATIONS

When based only on specialized and fragmented knowledge, the formation hides reality as a totality, assisting, within the scope of professional education, the demands of the labor market. On the other hand, the training aimed at the world of work enables to shift the focus to the integration of knowledge, the exercise of freedom, creativity, and autonomy.

To provide teachers with a teaching strategy in Integrated High School, we hope that the Didactic Sequence presented can stimulate the option for forms of pedagogical intervention that provide critical learning and integral training. In this sense, with this Didactic Sequence, we seek to develop reflection and the construction of new knowledge by constellation, to allow students some moments and spaces of reflective and critical attitude, the production of knowledge, the development of intellectual autonomy, and the understanding of social reality, which materialized in the activities developed and presented. The mosaics and commentaries demonstrate the process that science accumulates in itself as something that has come to be.

We achieved the general objective of the Didactic Sequence since the development of activities allowed us to highlight and develop important terms such as science, common sense, scientific method, the scientific community, social responsibility, and cognitive, ethical, and political values. It also allowed revisiting the history of philosophy, when it enabled to resume the emergence of science in ancient Greece, its permanence in the medieval period, often overshadowed by religious thought, the resumption of its relevance in modernity, at the time of the Scientific Revolution, and its advances, problems, and challenges in modernity.

Within the scope of this didactic proposal, the contents have the function of qualifying the discourse and the world view, which leave common sense towards the critical sense, and to assist the

student in the analysis of the dynamics and complexity of current life to critically identify the multiple factors that contribute to the composition of reality, offering conditions to propose alternatives when it alienates and excludes.

Far from pretending to be a ready-made product, which is impossible due to the breadth of the subject discussed here and the possibilities for the formation of philosophical awareness, the Didactic Sequence presented here allows adaptations or reformulations under other approaches and perspectives, or dealing with other themes.

We sought to bring the study of the central theme of this Didactic Sequence closer to the proposal for training for the world of work, which aims to bring together, in an articulated and integrated way, a scientific-technological and historical-social training that allows the student to understand the technical foundations, social, cultural and political aspects of current social and productive systems.

Finally, we believe that philosophical reflection is a way to build critical and emancipated citizens when it enables the exercise of reflection on fundamental issues for human existence, that is, an exercise of openness to the new, of expression of creativity, an exercise of questioning and suspicion in the face of easy and thoughtless answers.

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