

Impacts of Technological Innovation and Social Technology in Solidarity Economy¹

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ABSTRACT

This article, in order to expound the perspective of social technology as experimenting with alternative forms of economic exchanges and political relations, is divided into two sections. The first approaches the modern problematic connected with the relation between scientific knowledge and social organization, highlighting, on the one hand, critical perspectives that investigate the social and historical factors that have shaped dominant cognitive paradigms and, on the other hand, the scientific and technological policies that propose and promote the redefinition of scientific activity in terms of economic performance. The exposition emphasizes the social nature of the obstacles that confront these alternative possibilities.

Keywords: Economic policy, Science and technology policy, Academic policy, Social technology, Alternative development.

RESUMEN

Este artículo, para exponer la perspectiva de la tecnología social como experimentación de formas alternativas de intercambios económicos y relaciones políticas, se divide en dos secciones. La primera aborda la problemática moderna en

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torno a la relación entre conocimiento científico y organización social, destacando, por un lado, las perspectivas críticas que investigan los condicionantes sociales e históricos de los patrones cognitivos dominantes y, por otro, las políticas científicas y tecnológicas que proponen y promueven la redefinición de la actividad científica en términos de desempeño económico. La exposición enfatiza la naturaleza social de los obstáculos que se oponen a estas posibilidades alternativas.

Palabras clave: Política económica, Política científica y tecnológica, Política académica, Tecnología social, Desarrollo alternativo.

1. Introduction

The general meaning of the term “social technology” refers to the creation and use of knowledge by doubly disadvantaged populations (for lack of access to modern scientific knowledge and loss of the conditions most favorable to the reproduction of their traditional knowledge), in order to promote economic sustainability and the cultural and political strengthening of these communities. The formulation invokes a problematic constitutive of modern experience concerning the relations between knowledge, politics and society, that is, between the patterns of perception and cognition of the world, distribution of power and social stratification. It is a problem arising from the perception of the contradictions between the inequalities produced by the structure of class society and the modern project of a rational political organization, a way of life based on the secular values of universal equality and freedom and a disposition intellectual and moral for the critical, rational examination of every tradition.

2. Modern science and society

The general perspective of orienting the production and diffusion of knowledge from identified needs and interests to the groups situated in the lower strata of the social hierarchy emerged from the very internal dynamics of class society. From the perspective of the intellectualized aspects of the dominant sectors, the diffusion of knowledge was perceived as a fundamental condition of the cohesion of society in a juridical-political organization that affirms equality among all the citizens of a territory demarcated by a national state. From public lectures on the diffusion of academic knowledge to the major reforms of the national educational systems that have made school one of the central institutions of modern societies, the perception among the leading sectors is that the diffusion of literate culture and scientific and technicians

promotes the cultural unity necessary for the reproduction of a social organization that is not based on transcendental values (for example, religious values) for legitimizing inequalities in the living conditions of its different social groups.

In this sense, this general guideline represents well the ethnocentrism of the modern secular society that, from a position defined by reason and technique, impute all otherness, identified as ignorance and superstition, to the “delay” or “deviation” in relation to itself. From this point of view, the social problem of modern societies is a distribution problem, created by the reality of the scarcity of resources to be distributed.

As we know, however, as soon as the modern vision emerges, conservative and critical factions challenge the possibility of realizing the ideals of equality and freedom within the framework of bourgeois society established by industrial development in the nineteenth century. While the conservative view denies the possibility of a rational perspective for social organization, in its anti-intellectualist and characteristic anti-science position, the critical perspective incorporates the ideal of the science of expanding the domains of existence organized according to the principles of reason, the expansion of rationality to the ethical and social dimensions of existence.

It is, therefore, from this configuration that the instrumental rationality of population control and administration, and the critical rationality that examines the assumptions and social effects of the predominance of instrumental rationality along the historical development of Modernity, are confronted. Since then, the critical work of reason becomes reflexive, aimed at the logical and historical clarification of the development of reason itself and the limits of the predominance of instrumental rationality oriented to the technical control of the world. In terms of the radical aspects of social thought, the problem refers to the material and symbolic imposition of the modern perspective of technical control of the world, promoting the dissolution of the conditions of existence of other ways of life, other types of economic exchange and other forms of perception and cognition of the natural and social world, equally possible.

3. The question of the meaning of science

The critical aspect gains special outlines in the context of scientific and technological development driven by the Second World War and the Cold War from the mid-twentieth century. Considered as the first big science project, the production of the nuclear bomb is the paradigmatic event of the problematic around the

application of knowledge that confronts the technical power to be able to do with the power to choose to do or not to do, which situates, in the case in the emergence of the pacifist movement. In general terms, the social movements of the period place at the center of the conflict the question of the meaning of the production and use of scientific knowledge - knowledge for what and for whom? - rationally contesting the dichotomy between fact and value or, to use a common expression in the field of Human Sciences, positivist orthodoxy and its polarization between observation and interpretation. This is not an entirely new question. However, it is a historically important moment because of the diffusion of critical intellectual strands between social movements and, therefore, their strengthening in public debate, expanding and differentiating the links between the knowledge produced by the human sciences and the field of politics.

Contrary to the perception that the critique of the presuppositions of institutionalized scientific activity and the limits of its social use necessarily expresses a guideline contrary to reason, proper to an *ancien régime* position, the striking feature that unifies a plurality of movements and intellectual strands identified here as "criticism", is the perspective of extending reason to domains of existence considered subjective, according to the traditional view, such as politics and ethics, thus relegated to the dimension of interests and values, as aspects impossible to be examined rationally. Therefore, by mobilizing especially the philosophy and social sciences, the historical sociology of science allows to investigate the historical conditions of the institutionalization of forms of communication, argumentation and verification that favor the work of objectification. The specific autonomy of this sphere of activities thus depends on the production and social reproduction of the practical conditions for its exercise, as shown by the historical reconstructions of the emergence of various scientific disciplines. Criticism therefore goes to the limits of the historical development of reason, not to disqualify it as a whole, but rather to expand its scope, and thus formulates both the logical problems of such a venture and the social obstacles, especially invisible, that stand in the way.

In this sense, this perspective updates the insights about the social conditioning of the modes of perception and cognition that were present, in different ways, in the classics of the social sciences, providing the bases for the anthropological reflections about the different logics produced in different social organizations and for the explanations of the sociology of knowledge of worldviews from the different conditions of life in class societies.

To this end, the contributions of anthropology reveal the development of different logics in the history of human cultures and the ethnocentric character of the modern evolutionist view that supports the superiority of its culture in relation to all

others. In the context of sociology, the debate takes place in a context marked by the questioning of the professionalization of the social sciences according to the empiricist model established in North American universities, which establishes disciplinary practice as a domain of measurement techniques of individual opinions and attitudes, of great usefulness to the economic and political system. It is a question of challenging, from the scientific point of view, the anti-historical and antisociological representation of the social - which conceives society as an addition of individuals and culture as a sum of opinions - and the contempt for the theorizing of a physicist position, the conception of the applied social sciences, for which the neutrality of the research techniques assures the neutrality of the researcher and the knowledge he produces, implicitly guaranteeing the legitimacy of his applications. This questioning expands the question of the social factors of knowledge within the scope of scientific practice itself, taking into consideration the social location of the researchers, the institutional contexts of research and the assumptions of the methods, instruments and research techniques used.

In the space of researches of the Marxist approach to the popular classes, one can observe the same movement, for example, in the debate on the notion of ideology. Starting from the critique of the presuppositions of the notion of ideology as false consciousness and of the priority given to the studies of the industrial workers as potential bearers of an alternative project of society, and based on Gramsci's conception of ideology as a world view, one discovers in the manifestations of popular culture the work of production and diffusion of knowledge constituted in the experiences of communities and groups left over from the processes of social integration in modern standards.

The critical part of the participant research is inserted in this context, seeking to develop methodological alternatives for research, formulating problems and developing techniques and instruments based on different assumptions of the positivist model of professional research, which expands in the university departments of sociology and political science, market research and opinion institutes, and public agencies responsible for public health, agriculture, environment, and other policies. It differs from other participatory research conceptions by explicitly incorporating the social dimension of selection from the knowledge production perspective.

4. *Symbolic domination*

The social factors of thought and the possibilities of understanding social dynamics from the point of view of the experience of the subaltern social sectors, the cultural dynamics of the groups situated on the margins of the dominant social

systems, and the status knowledge of traditional cultures. The politicization of racial and gender relations and international relations between the north and the south revitalized, in its terms, the understanding of the arbitrary character and historical rootedness of perspectives considered universal by the work of symbolic domination of the objective and subjective resources to do so.

A sociological approach to the dynamics of scientific activities such as Pierre Bourdieu's can thus reveal that the situation is structured as a field within which different positions vie for the monopoly of scientific authority (technical capacity and social power) and, in the limit, the power to establish the legitimate definition of science, that is, of the problems, methods and theories considered scientific. To speak of science as a field means, then, to regard it as a space endowed with relative autonomy. Autonomy is founded on the specific type of exchange and communication by argumentation and verification that supports the existence of this exceptional microcosm, a historical product capable of reaching transhistorical truths, which, as said above, depends on certain social conditions that allowed it to arise and reproduce (Bourdieu, 1975).

But the social dimension of the field implies that the competing visions within the scientific fields derive *“a portion of their relative strength, even in the more autonomous fields, of the social force of those who defend them (or of their position), and of the symbolic efficacy of their rhetorical strategies”* (Bourdieu, 2007, p. 135). This is at the basis of the processes of disciplinary subdivision and accelerated differentiation of areas and specialties. It is the internal hierarchy of the field that defines the relative distances, in terms of social recognition, between the areas of knowledge, institutions, disciplines, careers, diplomas and individual trajectories within it.

The mobilization of scientific and technical knowledge for purposes of social legitimacy that moves the human sciences as well as the natural and exact sciences is deepened by the emergence of new technologies based on information technology. Experts have their role expanded as a source of legitimacy, based on science and technology, of perspectives of value in confrontation in social disputes. The relations between science and society become more complex and opaque in the political conflicts that reject its political nature, claiming the scientific, technical and universal character of its positions, basing the dispute around allegations of truthfulness and objectivity of the results that mobilizes.

In this struggle, the complex international circuits of professional elite formation and of import and export of specialized knowledge and expert systems are

outlined. Thus, Dezalay and Garth (2000, 2002) describe the way in which the diffusion of the neoliberal conception of the State (economic opening, privatizations and Washington Consensus) in the United States and Latin America since 1960 constituted an international market of technical knowledge, from the US university circuit and related institutions, such as international research agencies, multilateral banks, philanthropic organizations, think tanks and non-governmental organizations. The international strategies of lawyers and economists - by which they use the international capital accumulated in university degrees, expertise, contacts and legitimacy obtained abroad to build careers that lead to positions of political leadership in their countries of origin - are revealed to be central in the palace wars among elite American scholars, promoting the replacement of bachelor-politicians by technical-politicians in the intermediation of state technical knowledge in international circuits of diffusion that explain the growing implementation of the guidelines identified to globalization.

5. Scientific policies and organizational reform

It is in this register that the current scientific and technological policies of innovation incentive that propose the general restructuring of the national systems of science and technology for the production of commercial knowledge are located. They are based on the diagnosis of the emergence of a new phase of the economic system in which the capacity to obtain and use knowledge - to invest in knowledge assets, whether scientific, technological or innovatory contributions of various types - defines a new economic exchanges between regions, countries, companies and individuals, to refer to the definition of the first version of the OECD Oslo Manual of 1992.

In this “new economy” based on knowledge, growth depends on innovation, so the economic sectors will be more dynamic as they are linked to new technologies such as nanotechnology, biotechnology and information and communication technologies. In this scenario, the focus of state action in relation to science must be redefined, aiming at the incentive and management of innovation. In this way, science and economics are doubly linked: technoscientific development is placed at the center of the economic system, understood as the main factor for generating growth, and the economy is inserted in the scientific sphere to design and produce the instruments and mechanisms of the economic performance of knowledge production.

The diagnosis of new conceptions about the production of knowledge postulates the historical disappearance of institutional frontiers and specificities, notably between State and society or public and private sphere. According to this view, we live a time of complexity and uncertainty, which fades into the stable categories of

modernity (such as society, market, culture, science); according to an inexorable international trend, the traditional boundaries between university and industry, basic research, applied research and product development are becoming extinct, revealing the need for a new social contract between science and society.

From this we conclude that we are facing a process whereby the institutional impermeability of the previous period is transformed into porosity: institutions begin to alternate roles among themselves and diverse interests merge in the production of commercial knowledge, generating a new way of producing knowledge, which scientific activity (Etzkowitz, 2000). Thus, according to one of the aspects that make up this view, until recently science was produced according to the mode 1 of knowledge production, characterized by well defined disciplinary identities, established academic hierarchies, homogeneity of knowledge produced and distance between discovery and application of new ideas. At present, on the contrary, research operates in a mode 2, problem-oriented, transcending disciplinary boundaries, characterized by heterogeneity and emphasizing the application context (Gibbons et al., 1994).

Although described as inexorable processes underway, these changes require, according to their proponents, extensive reforms and new diffusion mechanisms by countries that wish to participate in global competition. In addition to external controls and conventional science evaluation systems, which are considered insufficient to foster required changes and potentially generate resistance among research groups, mechanisms need to be developed to encourage the voluntary internalization of the new perspective between the leaders and researchers from the science and technology producing institutions, supposing, above all, the incorporation of the production management guideline and knowledge producers.

Critical examination of these doctrines has pointed out that they exaggerate the dimension of consensus and the convergence of interests between actors and institutions in a way incomprehensible to the sociology of institutions approach. Unable to make distinctions, they focus on a small sector of the vast contemporary scientific field, composed of diverse institutions and extensive and varied areas of knowledge. By limiting itself to the most interesting areas of knowledge for the production of commercial knowledge in its present situation and totalizing the model for all scientific research and cultural production, the new theories emphasize the homogenization of the production, becoming incapable of incorporating the dimension epistemological in its analysis as well as to understand the reproductive function of education. Its emphasis on communication and information leads to the construction of schemas that describe science as occurring in a non-institutionalized, fluid and amorphous environment, without considering that agents are linked to institutions and it is this institutional anchorage that bases and gives meaning to interactions

between agents. Moreover, this emphasis on the communicative dimension is silent on concrete skills and abilities. As it is known, but the new theories do not incorporate it, the knowledge demands appropriation of the information by the subject, what presupposes the access to certain types of resources and special abilities. In short, the notion of contextualized knowledge they disseminate fails to contextualize the production of knowledge in the global macroeconomic scenario, taking into account the implications of scientific development for the intensification of inequalities between countries and regions.

With regard to knowledge production excellence centers and knowledge producers, the innovation perspective establishes the predominance and the new meaning of the academic "third mission". Ignoring the many senses of university extension that have developed over time - many of which are involved in the historical processes described here - the social mission of promoting economic development (and thus direct cooperation with industry for transfer of knowledge and technology) as the main academic guideline of today, from which teaching and research must be redefined. Whether it is the key to innovation in high-tech areas or in the promotion of regional development, the new economic conception of the university's social purpose demands the task of redefining the type of knowledge to be produced and taught, the forms of knowledge organization and producers of knowledge and desirable practices, ie the working style according to the standards of the evaluation models that define the formats and the rhythm of production and dissemination of results. But to support the argument, as we can see, this conception must completely suspend the long history of university extension, around which, as it was sought to point out in this text, different visions are confronted about the meaning of the social diffusion of academic knowledge.

It is, therefore, within the scope of this broad problem that places the contemporary debate around the relations between patterns of perception and cognition of reality and social and political hierarchies, which is inserted the proposal of "social technology" of articulation between technological development, equity social and democratic distribution of power. We can then proceed to the examination of this proposal, considered as an expression of the experiments in search of alternatives to the predominant system of economic exchanges, seeking to identify the possibilities that opens and the main dilemmas that faces in the Brazilian social and political scene.

6. Social technology: definitions and obstacles

Rooted in the tradition of Latin American Marxist thought and inserted in the contemporary strands of social studies of science and technology, the reflection on Social Technology has as main interlocutors, in disciplinary terms, the mainstream economic theory and, internally to Marxist thought, orthodoxy economist, seemingly antagonistic perspectives that in fact share the same assumptions about technical neutrality and determinism. It is, therefore, through the critique of the notions and directives that constitute the perspective of Conventional Technology, socially predominant, that incorporates the strongest theses about technological neutrality and determinism, that the author defines the distinctive characteristics of the alternative notion of technology Social.

A first step is the critique of the world view that underpins the dominant notion of an entrepreneurial and competitive ethos, capable of generating innovation, as the only effective and realistic perspective for individuals and groups in the current social structure, re-developing and disseminating for all, conceived as individuals, the risk posture and risky initiative in the midst of general competition, competition of all against all that, according to this view, characterizes the market economy, free labor and individual rights proper to the capitalist economy of bourgeois social organization.

In association with this refusal, the directive also states that the success of the informal economy - or Solidarity Economy initiatives - takes place when its products become commodities and “win” in the capitalist market. This view confers on initiatives of solidarity economy a “subordinate function” to the dominant economic system, within which they can only exist as “waste”, not even constituting themselves as alternative economic practices. Thus, the strictly economic notion of “social inclusion” of the excluded should be broadened, associating the economic, political and cultural dimensions of integration. The dominant proposal since the 1950s, from marginal inclusion to the central economic system as a fundamental driver of the economic and social development of disadvantaged social sectors, has narrow structural limits (as the central system develops by reducing the number of jobs) and ends reproducing or even aggravating the precarious conditions of life of the “included”.

One nefarious consequence of the predominance of this view is that it creates a “logic of despair” in the design of “inclusion” initiatives. An expressive example of this logic in Brazil is the collection of household garbage, which included, with economic advantages for the formal system, the work of so-called “can collectors” in their informal activity. The collectors were thus incorporated into the circuit of capital accumulation, in an advantageous socio-technical arrangement, which allows the country to rank second in the world ranking of aluminum recycling, losing only to Japan. But it is the low schooling and the (which characterize them as not qualified for

jobs in the formal labor market) that define their employability within this arrangement, an element as fundamental to their economic success as the maintenance of informal mechanisms for the regulation of work, since, if the collectors were paid according to the legislation, the activity would lose its competitiveness. Thus, the Brazilian phenomenon “catadores” exemplifies how this type of capitalist organization of informal work depends on the conditions of exclusion and, consequently, on the overexploitation of labor in force in the country. The recycling industry does in fact incorporate a large contingent of disqualified persons into the formal economy, but it does so by reproducing - or even aggravating, the conditions of its disqualification. In economic terms, experience is characterized as a successful innovation, which has given competitiveness to the domestic industry, but this diagnosis depends on the disconnection between its positive economic results and its unfair social conditions that, characterized as negative externalities, are put out of the field of action of the economic enterprise.

In the direction of the work of redefining another logic beyond these limited experiences that maintain the alternative experience as residue, or subordinate functionality, and based on the experiences of Solidary Economy and Social Technology, we must address the problem of the use of knowledge as a form of control in capitalism in order to identify the obstacles that interfere in the daily life to these experiences, by the predominance of the dominant way of seeing right there where one tries to create a difference. Against this economic and technological determinism, the argument is that, beyond the form of property (private or collective), it is the type of control and cooperation that conditions the technological device, so that one can not simply adapt conventional technology, but it requires a Technical Partner Adequacy that transforms the characteristics of the technology that the capitalist control attributed to him, re conceptualizing from other criteria, that are logically possible, but socially not evident.

Every labor process implies some kind of control, so the problem is not built in terms of capitalist control or lack of control. Shifting from product analysis to production process, he argues that what characterizes Conventional Technology is not the private ownership of the means of production but rather the type of control and the form of cooperation that such control determines or empowers. That is, private ownership of the means of production implies a form of cooperation that presides over the design and use of Conventional Technology, which retains these characteristics even when private ownership of the means of production ceases to exist.

The problem is precisely the work of enlightening this other type of control and cooperation and of defining the criteria to identify it, considering that in everyday

experience conditioned by capitalist structures, other ways of seeing are very difficult to envisage while the categories of vision and classification, produced by an intense work of symbolic domination, immediately present themselves as evident and necessary.

In contrast, in order to give the technology the characteristics compatible with Social Technologies, replacing the aspects of Conventional Technology that act as obstacles to sustainability, it is necessary to consider that, by measuring the variable property form (ascribed to the socioeconomic context) and the control variables and cooperation (linked to the productive environment), coercion operates, understood as linked to the relations between the State and society that surround and permeate the productive environment, that is, the type of social contract that these relationships establish and legitimize. Coercion, in this sense, is responsible for determining the characteristics of the dominant conventional technology.

Thus understood, Social Technology can play an essential role in the process of building an “other economy”. In a first level, Social Technology can act as an enabling element of the sustainability (economic, social, political, cultural and environmental) of the solidary enterprises. On the second level, it can function as an articulating element, through the strengthening of the Solidarity Economy, of alternative forms of production and social organization to those engendered by capital. And finally, in the broader and longer-term cognitive level, within the broad scope of the process of building another model of development, Social Technology may come to take the place of technoscience, which today guides the infra and superstructural spheres of capitalist development and thus the perspective of technical control of the world.

For the concretization of these potentialities in the direction of the articulation between solidarity economy and social technology there are two institutional focuses. In addition to the State, as an instance of elaboration of public policies capable of promoting and inducing solidary enterprises of production of goods and services with intensive use of Social Technology, promoting the complementation and the articulation of productive chains according to the logic of associativism and participatory self- the public institutions that produce science and technology, and formators of knowledge-producing professionals constitute another key instance for the design and implementation of alternative technologies. New arrangements are needed in the dimensions of teaching, research and university extension, among which stand out the technological incubators of popular cooperatives. However, taking into account the predominance of the vision of technological neutrality and determinism in universities, which is strengthened by the contemporary diffusion of the perspective of entrepreneurship for innovation.

In this sense, social technology is characterized as another example of the alternative perspectives that have contributed substantially to a better understanding of the complexity of social and natural processes, designing models of action capable of producing beneficial effects in different dimensions (cognitive, economic, social, cultural and environmental), revealing the historical possibilities of realizing the modern ideals of universal equality and freedom and a way of life in which reason is articulated with social justice and human flourishing.

Final Consideration

The conflict between different perspectives of value is seen as a constitutive aspect of the modern experience and as such lies at the center of contemporary debates around the meaning of science and technology. Given the effects of recent developments in technoscience, the search for social alternatives increasingly involves examining the fundamentals of the technical relationship with the natural and social world.

The critical strands of the human sciences and alternative social and political movements have contributed to the understanding of the ways and mechanisms by which specialized knowledge plays the role of social and political legitimation of its bearers and worldviews. It is the very social conditioning of the patterns of perception and cognition of the world that guide the ways of thinking, acting and feeling of modern culture that acts as a great obstacle to the diffusion of this knowledge and, even more, its use in experimentation of alternative modes of social organization. In addition, the accelerated constitution of globalizing import and export fields from the dominant perspectives in the international circulation of professionals, experts and experts has contributed to the broad expansion of technoscientific perspectives and their mechanisms, techniques and devices of production management and knowledge producers scientific and technological.

Thus, the contemporary emphasis on the social necessity of technoscience, diagnosed as the basis of the so-called global economy and culture, may contribute to obscure the understanding of the strategic role of the dispute over the legitimate definition of science and scientific rationality in contemporary conflicts about civilization model. In addition, it may conceal the problem of the current difficulties of communication between science and society. The question of social obstacles to the adoption of certain rational perspectives and the application of certain scientific and technical knowledge established for the orientation of practices in the various spheres

of social activity, including the sphere of production of scientific and technological knowledge.

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