



**The development of technical and scientific professional education systems: an analysis through activity theory using Engeström's historical type model. (English Version)**

*O desenvolvimento dos sistemas de formação técnico-científica: uma análise pela teoria da atividade usando o modelo de tipos históricos de Engeström*

*El desarrollo de los sistemas de formación técnico-científica: un análisis por la teoría de la actividad utilizando el modelo de tipos históricos de Engeström*

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**Abstract**

The need to wider disseminate the technical and scientific education arising from the modern modes of production was an influential factor in the establishment of the current educational systems. Attributing to education a more utilitarian perspective, responsible for many features of the curriculum and school practices, the educational model has been adapted to the new demands and levels of social organization. In order to better understand this process as well as its internal conflicts, we will use notions of the activity theory, specifically the historical type model developed by Y. Engeström to systematize the evolution of an activity throughout of history.

**Keywords:** Activity theory. History of Education. Technical and scientific professional education.

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### **Resumo**

*A necessidade de disseminar a formação técnico-científica advinda com o modo de produção moderno foi um fator influente no estabelecimento dos atuais sistemas de ensino. A partir de uma perspectiva mais utilitária dada à educação, responsável por muitas características do currículo e das práticas escolares, o modelo educacional foi se adequando às novas demandas e níveis de organização social. Para compreender melhor esse processo e seus conflitos internos, utilizaremos os conceitos da teoria da atividade, mais especificamente o modelo de tipos históricos elaborado por Y. Engeström para sistematizar a evolução de uma atividade ao longo da história.*

**Palavras-chave:** Teoria da atividade. História da Educação. Formação técnico-científica.

### **Resumen**

*La necesidad de difundir la formación técnico-científica que surge con el modo de producción moderno, era un factor influyente en el establecimiento de los sistemas de enseñanzas actuales. Desde una perspectiva más utilitaria dada a la educación, responsable por muchas características del currículo y de las prácticas escolares, el modelo educativo se ha ido adaptando a las nuevas demandas y niveles de organización social. Para entender mejor este proceso y sus conflictos internos, utilizaremos los conceptos de la teoría de la actividad, más específicamente el modelo de tipos históricos elaborados por Y. Engeström para sistematizar la evolución de una actividad a lo largo de la historia.*

**Palabras claves:** Teoría de la actividad. Historia de la Educación. Formación técnico-científica.

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## Introduction

The social role of educational processes and knowledge contents that become part of the school curricula have undergone many changes over the centuries. The current approach has its earliest origins in historical inflows that led to a consolidation of the European modern spirit of the seventeenth and eighteenth centuries.

The rupture with scholasticism during the European Renaissance led the thinkers of that period to a growing search for the philosophers of antiquity and to an attempt to rehabilitate the classical model. However, some factors, such as the need for a technological production resulting from a period of great navigations and intensified by the new modes of production that began to settle, other than the search for dominating nature that the emergent experimental scientific method proposed, demanded from the thinkers of that period a more utilitarian attitude towards knowledge. (STRUİK, 1987) In this sense, they were more concerned in describing the observed phenomena and in applying their theories than to search for general principles or for the creative elements of the “universal harmony”, as the ancients did.

Of course, the new perspective of knowledge also had a significant impact on education. The teaching of the new theories aimed at first to oppose the medieval world view, familiarizing young people with new explanations of physical phenomena brought about by the modern scientific method. The eighteenth-century political revolutions eventually consolidated the new world view which had emerged in Modern Times, promoting more vigorously an economical development grounded in a progressive technological improvement. Thus, the technical knowledge of artisans working in precarious workshops, who passed their knowledge to their few apprentices, did not respond anymore to the needs of technological production required by the new mode of production. It was necessary to disseminate scientific knowledge that was becoming more specialized and focused on the development of new technologies. (ROSSI, 1970) As mathematics is the language of modern science, this knowledge domain became critical in this process. Therefore, with the constitution of technical and scientific specialties, new mathematical theories, expressed through its algebraic language, occupied a significant part of the curricula of courses focused on the education and on the use of scientific knowledge for handling physical phenomena.

Such growing diffusion of technical knowledge based on scientific theoretical models using mathematical language required an expansion of science education, eventually triggering a subsequent need for knowledge massification. Thus, the formal education, which was earlier reserved primarily to the formation of a thinking aristocracy, became popular and gained more and more importance.

To evaluate this process of development of scientific and technical education systems during the modern period, we will use a model proposed by Y. Engestrom to understand historical types of an activity. In this respect, the use of the cultural-historical activity theory to support social studies has shown to be an important model for organizing and analyzing research data. Its conceptual network enables the delimitation of an event under study, without isolating it from the environment within which it develops and from the history of its constitution.

According to Engeström, three principles must be followed to conduct a study using the activity theory. Firstly, one must consider the activity system as the unit of analysis. The second principle would be perceive the activity, or the activity system, in its historicity. In other words, one must seek to understand the historical development of the activity system in relation to its organization and social expectations involving the mobilization of a society for processing a given object. The third principle would be to search the internal contradictions which generate changes in the activity. An investigation guided by such principles would allow the reconstruction and analysis of an activity in connection with its history, its practices and its objectives.<sup>3</sup>

These principles are guiding Engeström in a case study where he applies the theory of activity as a framework and as an analytical model to understand a specific activity that is developed within the public health service of Finland, in a context of change. Engeström (1996), entitled “Developmental studies of work as a testbench of activity theory: The case of primary care medical practice”, is proposed to test activity theory while applying it to the study of a particular case.

In this article, we will specifically dwell on the second principle stated by Engeström for researching using activity theory. It concerns with the understanding of the historical development of an activity. Using the scheme proposed by Engeström in his study, which was applied to the evolution of medical practices, we will examine the historical development of schooling processes that aim at technical and scientific education. We believe that evaluating the expansion of technical and scientific knowledge throughout Modernity and its influence in shaping school curriculum brings important insights for understanding the current educational model in its various educational levels.

## 1. The activity system as the unit of analysis

The formulation of the cultural-historical theory of activity begins with the studies of L. S. Vygotsky (1896-1934), giving rise to the development of a school of thought within psychology. It is founded on an understanding of human activity as a unifying element of social life and the human psyche. Having as a starting point a dialectical materialist view of history, the followers of the historical-cultural school initiated by Vygotsky have opened a new perspective within the psychological studies of humans, to explain the development of the psyche through the relationships, articulated by the activity, between the subject and the objective world. (VYGOTSKY, 1978)

Regarding the study of this relationship, Vygotsky proposed a model that has, in the mediated action, its unit of analysis. To be actualized, a human action encompasses three basic components: the *subject*, the *object* and *mediation tools*. The subject is the agent that acts directing its actions to the object of the activity. The relationship between the subject and

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<sup>3</sup> Actually, Engeström's view of activity theory has changed over time. The need to raise the multiple voices which are present in an activity system and the idea of seeking possible expansive transformations in the activity systems, grounds which are already covered by Engeström at other times, are included amongst these three mentioned principles which should be considered in a research adopting the activity theory approach. (DANIELS, 2001) In our case, as we will make use of a specific research conducted by Engeström, we are following his model in this current work.

the object, which can be a material, emotional or cognitive object, is always mediated by tools, or artifacts, of mediation. The tool is what enables *processing* the object. The outcome of the activity is the object transformed to meet some human need. The tools used would be elements of the culture in which the subject is inserted. These elements may be either tangible, such as machinery and instruments, or abstract such as laws, procedures, methodologies etc.

A. N. Leontiev (1903-1979), a member of the cultural-historical school, who together with other researchers continued the studies of Vygotsky, argue that the representation of the mediated relationship between the subject and the object would be valid for an analysis at an individual level, but it would be insufficient to explain the role of the subject's relations with the social environment while carrying out activities, as well as the constitution of his/her individual consciousness.<sup>4</sup> In Leontiev's view, the activity would be *socially mediated*. His analysis emphasizes the role of division of labor and the rules that mediate the relationship between individuals in the activity. The *division of labor* is a manifestation of the collective nature of the activity and it would serve the object's transformation process aiming at the satisfaction of the subject's needs. (LEONTIEV, 1978)

In this perspective, the subject can be understood both as an individual and as a group of individuals belonging to a community engaged in the same activity. *Community* would be a larger group of individuals who share the same object within the activity. According to the theory of activity, all human action always has an object in nature, i.e., it is directed to an object. The activity could be defined as the way the subject acts, being the subject an individual or a group, consciously directed to an object.

An investigation of an activity requires the identification of its structure and the relationship between its components, specifying the role played by each of them within the activity at specific times. Thus, it is crucial to consider the activity inserted within a historical context, trying to understand how this context limits the conditions for the establishment of the actions and also how the activity has developed and changed over time, until assuming the observable shape.

Such perspective proposed by Leontiev to account for an activity would allow a broader view of the social environment role in the mediation amongst the subject (or group of individuals) and the object, which would materialize more clearly in the division of labor. Such perspective on the human activity as the product of social network processes was restructured by Y. Engeström in his version of the theory of activity. Exploring further the role of community within the activity system, Engeström proposes a model of representation where these new elements of mediation between the components of the activity are integrated in a systemic way.

Other than the mediation by tools, the introduction of the community in the activity framework imposes other elements of mediation. The relationship between the *subject* and the *community* would be mediated by *rules* that would be norms, tacit or otherwise, agreed socially. The mediation between the *community* and the *object* would give the *division of*

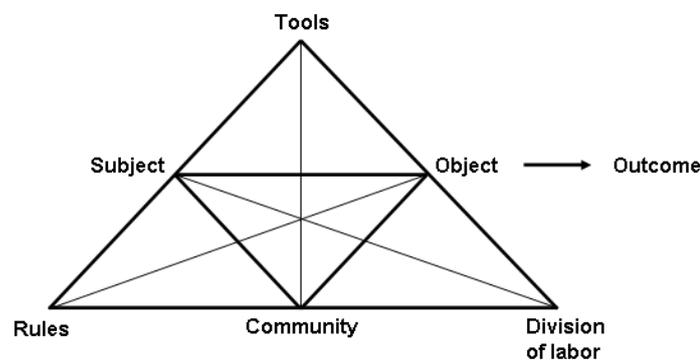
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<sup>4</sup> In general, the theory of activity is considered as a further development of the historical-cultural psychology, but some authors have questioned to which extent there would be continuity or rupture between Vygotsky and Leontiev, as it could be seen in the debate reported by N. Duarte (DUARTE, 2000) and A. Kozulin (KOZULIN, 2005).

*labor*, which would be linked to the way the community is organized toward an object to achieve a result. The division of labor allows us to identify the hierarchical elements within a community that are expressed in the allocation of tasks legitimized by the social environment.

Gathering all these processes of mediation, Engeström constructs a model that would allow the representation of a collective activity, where the various subjects or groups perform actions not directly oriented to the object of the activity, but related to the activity by the division of labor. We would not have an activity mediated as the unit of analysis, but an *activity system*, which is the central concept in Engeström theory. In this activity system, the subject would be connected to their community through a network of interconnected actions collectively negotiated and distributed according to the division of labor.

**Figure 1:** Expanded triangular model to represent a collective activity system.



## 2. The historicity of an activity system

Each activity has its development in a period of time and it is inserted within a specific culture. Such development usually occurs irregularly and discontinuously. In order to understand a particular situation, it is necessary to know how it developed till the current state, which changes it has suffered, that is, how the activity has evolved over time to assume the studied shape.

The changes in the activity throughout its development, in Engeström's perspective, should be motivated by internal contradictions in the activity system. From this perspective, the internal contradictions would boost the changes and the development of the activity, manifesting itself by imbalances or tensions that become evident through problems within the activity system. This development occurs when these contradictions are overcome. The contradictions provoke the questioning of the practices by the subjects and, therefore, cause disruptions that can bring expansionary changes in the activity through proposals of innovations. (ENGESTRÖM, 1987)

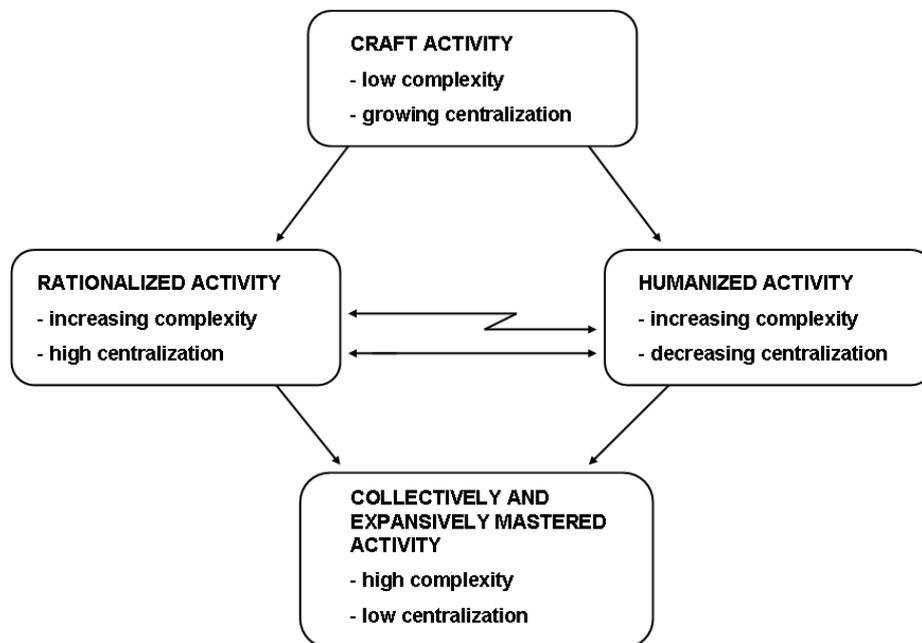
An understanding of the role of these contradictions in the movement of an activity makes possible the reconstitution of its evolution and the development of its practices throughout its history. According to Engeström, a great problem in this type of reconstruction of the development of practices is related to the establishment of criteria to categorize cognitive structures, forms of action and organizational models, considering some of them

more advanced than others. For schools of thought which conceive theories of linear development, "history and intellectual development appear as advancement from the primitive society (and primitive thought) to the developed Western civilization (and formal-logical thinking)." (ENGESTRÖM, 1996, p. 69) Defending the idea that the intellectual development does not follow a linear route, Engeström says that highly complex and abstract forms of thought and communication are found in societies which are considered primitive. However, "this does not necessarily imply that there can be no direction or 'progress' in history." (Ibid., p. 69) According to Engeström, Marx would have found these criteria of progress in the development of the productive forces. The collective field of the increasingly more complex social processes of production which emerge with the replacement of manual labor directly by industry and automation, lead to the development of the subject as a "social individual", which would be the way to measure the progress.

To make this evaluation, Engeström proposes a distinction between *historical modes* and *types*. The *mode* is the way in which an activity is actually organized and performed by its participants at any given time. This mode "resembles a continuously evolving mosaic, consisting of various parallel interests, voices, and layers." (Ibid., p. 69) However, the activity system as a whole also has some qualitative models, which are *ideal-types historically identifiable*, of its components and internal relations.

Based on this differentiation, Engeström constructs the following scheme, which would be an overall conceptual model that allows the identification and analysis of these *historical types*, characterized by the two main variables, which are the *degree of complexity* and the *degree of centralization*.

**Figure 2:** General historical types of activity. (ENGESTRÖM, 1996, p. 70)



Classical units of *craft activity* are usually workshops with a minimum specialization of labor, where apprentices perform tasks under the supervision of an "omnipotent master". In other words, the work in these units, albeit on a small scale, is highly centralized.

The classical unit of *rationalized activity* is the industrial factory and the subsequent bureaucratic office, where machines and the size of the organizations require complex interactions. In such environments, the division of labor and the centralization are strongly accentuated.

The *humanized activity* is represented at a same level in the diagram presented in Figure 2, being contemporary and related to the rationalized activity. The two arrows connecting them in the above scheme represent an hostility and at the same time, a mutual dependence of both types of activity. According to Engeström, classic attempts of humanization are found "in the semiautonomous industrial work groups, propagated by the 'quality of working life' movement and by theories of sociotechnical systems." (Ibid., p. 71) In this type of activity, there would be a complexity of interactions such that the centralized control and the division of labor end up creating motivational and quality problems. As a result, there is a partial decentralization of control procedures, time and group division of labor, but the strategic content of the tasks and products continues obeying centralized decisions.

The last historical type – of the *activities dominated collectively, and expansively* – would be just a hypothetical construction. With an increasing complexity, it is assumed that the motivational, communicative and cognitive contradictions inherent to the rationalized and humanized activities motivate the emergence of innovative solutions. The main feature of these solutions is the fact that the decentralized work teams begins to create new concepts and to plan the objects and products, other than to organize its long-term work. Thus, the teams and working communities become involved more strongly in the reconstruction of their own activity systems. Such initiatives would make the development and the collective implementation of sophisticated theoretical and conceptual tools part of everyday activity.

### 3. The historicity of medical practices

In his use of activity theory to study the ongoing changes in the Finnish health system, Engeström applies his model of historical types to evaluate the historical development of medical practices. According to him, there would be a large number of empirical researches about the doctor-patient relationship, where repeatedly he finds that "the relationship is characterized by asymmetry, professional dominance, and subtle repression of the patient's concerns." (Ibid., p. 89) However, there were few studies that address this issue in terms of the historical evolution of these practices.

From the few studies about the sociology of medicine, Engeström traces the development of medical models, according to the categories established by him to identify the historical types of an activity. Based on these works, he proposes an evolutionary distinction between three types of "medical cosmologies," which would be: a bedside, a hospital and a laboratory medicine.

In bedside medicine, the object was the person with his or her total psychosomatic disturbance. In hospital medicine, the object is the case, with its organic lesion as the focal point. In laboratory medicine, the object is a cell complex and the biochemical processes within it. (Ibid., p. 90)

In Engeström's view, this analysis indicates how the modern medical practice had been formatted around treatments related to the current laboratory researches.

There would be as well another perspective on this development of the current form of the doctor-patient relationship, which is based on the transformation of private practices, charging fees for service, in rationalized and corporative practices. This current corporatized and rationalized medicine would take two basic forms: the private medicine, aiming profits, and the public one, which strives to achieve cost efficiency. In the hospital medicine, the object would be an anonymous case of a physically localized disease. In the corporatized medicine, with emphasis on the processes' rationalization, productivity and efficient costs, the object would be even "more anonymous", treated as an input and an output unit regarding visits, procedures and hospitalizations, satisfying, for example, requirements of an accounting control.

In contrast to the process of rationalization and corporatization of the medicine, other serious medical perspectives have also emerged, in various ways, such as the holistic medicine, psychosomatic medicine or humanistic medicine. In general, this kind of medicine can be grouped into two different species. One of them would be built on a notion of psychoanalytically oriented humanization, which emphasizes the deep emotional conflicts. The other would be founded on a communicative and sociopsychologically oriented humanization, which would emphasize the skill of interpersonal understanding and empathy.

Each perspective which is present at the various stages of development of medical practices brings with it the marks of previous models that coexist as layers of these models within the current activity system. However, despite of the fact that the evolution of the activity systems does not occur by sudden ruptures from past models, it is possible to draw a developmental sequence in order to understand how some practices were formed and established.

To evaluate this process, Engeström uses his classification categories of historical types identified for these medical practices. For him, bedside medicine, private practice fee-for-service and hospital medicine can be considered forms of craft activity. This phase of the historical development of an activity would be characterized by a high centralization of decisions on procedures within the practice, in the case of doctor attending the call, with a low complexity of social interactions needed for the activity actualization. The paradigmatic example of this type of activity would be a workshop following the guidance of a master craftsman who centralizes the decisions on the operation of the production process, which usually takes place in a small scale. That would be the model followed by the bedside medicine, the private practice fee-for-service and the hospital medicine, having this latest one taken this "qualified medical crafts" to the top of the professional authority, establishing this one as the core of medical work.

According to Engeström's categories, the corporative medicine and the laboratory medicine can be regarded as forms of *rationalized activity*. In these types of medical practices, the scale of care would be expanded, and the interactions between the participants would have a high degree of complexity. For their effective realization, there is the need for a more consistent division of labor, which would lead the organization of the activity in a centralized way, in addition to the use of technologies that would promote some standardization in the procedures and the conceptions which validate the medical practices.

As the complexity of the interactions is emphasized in an activity, this centralized control of the procedures supported on a rigid division of labor can create problems. As a result, tensions arising in this process end up promoting certain decentralization in the control of the activity, which can lead to changes in the division of labor and orientation procedures. At this stage, it appears a type of activity referred to by Engeström as *humanized*, which is in continuous contrast to the rationalized activity with regard to centralization. In the case of medical practice, humanized, holistic medicine would be a form of this type of activity.

Finally, Engeström's scheme for the evolution of historical types of collective activity systems would be completed if including a medical practice model that could be classified as an *activity collectively and expansively dominated*. For the existence of this type of activity, it would be necessary a medical practice that combines a high level of complexity with low centralization, "something seldom witnessed in today's medical practice dominated by huge conglomerates and bureaucracies." (Ibid., p. 92)

#### **4. The development of technical and scientific education on the model of historical types of Engeström**

The activity system we wish to analyze have its development directly linked to the evolution of school processes and professional education. In reference to its evolution over the modern era, the technical-scientific education was largely conditioned by the expansion of industrial production model.

The emergence of the modern scientific method occurred alongside a great change in European economical and cultural environment, when the needs of a new production model demanded an expansion of education systems. Prior to the establishment of the great school systems, which allowed the expansion of formal education and shaped some standardization of the classroom contents and processes, higher education related to technological areas was just beginning, and the most basic level of technical education was provided on small scale directly in the workshops. In the workplaces, these apprentices developed their professional skills helping the operation of workshops under the guidance of master, the holder of knowledge. This activity, which aimed to train new craftsmen, did not go through a broad and previous theorization of the specific know how of the profession, but in fact through direct learning in practice oriented by the master, who centralized decisions and procedures. (MANACORDA, 1992) In general, if compared to more formal activities of technical education included in schools, the methods used in the workshops, if concerning the degree of centralization and service scale, had lower complexity interactions. Thus, following the conceptual model of Engeström to classify the historical types of activities, we could qualify this technical educational model as a *craft activity*.

As a further result of deepening the industrial model of production, the knowledge of the craftsmen, who worked in small workshops and taught few learners, becomes insufficient to meet the demand for technical education. It was necessary to disseminate the technical and scientific knowledge in a larger scale, which had become more specialized and focused on the development of new technologies. Such change required more complex processes of organization to deal with theoretical knowledge increasingly elaborated. Thus, the teaching was gradually moving to specific educational establishments, being organized and split at various levels and technical specialties, resulting in the formatting of the curricula until reaching the molds we know today. The fragmentation and specialization of the formative processes, that have occurred since the most basic technical education up to higher-level science courses related to the development and handling technologies, were combined with a significant increase in the number of students enrolled in such more formal model of school. The result is a teaching and learning environment with more complex interactions than those existing in ancient workshops. This fact emphasized the need for greater division of labor within the activity, although the practices and decisions still centralized - whether in the teacher, or in the administrative staff or in the makers of school models in each country, as they defined procedures and the paths which should be followed by all participants in the activity. With these characteristics, following the terminology of Engeström, we could say that this type of organization of technical and scientific education in the school environment, as widened, was increasingly becoming a *rationalized* activity.

In a society that began to evolve around an accelerated technological development, technical and scientific education ended up winning a privileged space in school curricula. In order to educate people to be able to apply scientific knowledge to solve practical problems, it is necessary to develop in students the ability to apply theoretical models for the understanding and manipulation of physical phenomena. This pragmatic view of knowledge, which was amongst the reasons for the creation of the great school systems and which had influenced the later massification of basic school in the central countries, has an important role in the formation of cultural values related to the school, its curriculum and practices.<sup>5</sup> Thus, the educational process turned out to be very structured by the need for technical and scientific education, which required some standardization of procedures and contents, thereby restricting some ways and possibilities that formal education could offer to the individual. (SAVIANI, 1986)

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<sup>5</sup> It should be emphasized that, despite the importance of the demands exerted by the productive sector on the expansion of educational systems, the claim that the educational processes are fully fashioned according to expectations of the production model does not fully express the reality. In fact, the idea of a public education as a right provided by the state was consolidated. As a result, education also began to be a consumption element, not necessarily related to its practical role in professional education. In addition, the dimension of the school systems in modern societies brought about a knowledge industry, which employs a large number of people and consumes high resources. Thus, the educational system becomes itself a source of demands, under the constant creation of justifications of its value to society. It is a cycle that justifies itself and also has great force in the formation of values related to education. Thus, the educational system becomes itself a source of demand, under the constant creation of justifications of its value to the society. It is a cycle that justifies himself and also has great force in the formation of values related to education. Thus, although there is a relationship between the production system and education, such link is not as straightforward as one can expect. Even the technical needs of the labor market are not enough to explain the processes of expansion of education systems and how these systems are organized. The very structure of the world of work can also influence this relationship. More organized professions acquire power to regulate types of knowledge and educational procedures, which do not necessarily respond to the immediate needs of the labor market in relation to the profile of its professionals. In addition, the capacity and the speed with which the educational system responds to the productive sector rely heavily on their financial capabilities. (SCHWARTZMAN, 2005)

We can identify, since the very beginning of the modern school, a tension between the organization of the education system whether aligned with a *rationalized* activity and with a more *humanized* activity. The latter makes possible a large-scale service within the school environment, though at the same time, includes diverse educational models. The emergence of a humanized activity, as argued in the previous section, just stems from excessive standardization, due to the highly centralized control of the proceedings, which would create problems in the motivation and the quality of execution of the activity. Regarding the historical development, according to Engeström's model, this type of activity would be part of the same evolutionary stage of the rationalized activity, keeping with her a conflicting relationship that aims the establishment of a greater decentralization in the control of the proceedings.

Regarding the educational models from the point of view of their institutional organization, and taking into account Engeström's conceptualizations, you can see many recasts of school practices proposals in response to problems arising from excessive centralization of the activity control, which generates standardized systems with low flexibility in a highly complex environment in the interactions between participants. Observed from Engeström's conceptual view of the historical types, this ambivalence, which in principle may seem to be contradictory, would be inevitable as it is an inherent part of this evolutionary stage of an activity in which demands for centralization and decentralization promote changes and improvement of procedures.

Nevertheless, according to Engeström, this flexible process that provokes transformations in the activity features may become insufficient for its development. This occurs when the increasing complexity of interactions reaches such a level that even with decentralization in the control of certain procedures and the division of labor, the lack of knowledge of the participants on the content of tasks and the products of the activity creates limitations for the emergence of innovations. Thus, the development of the creative processes demands a deeper decentralization of decisions within the activity. As a result, there would come a stage of organization of the activity called by Engeström *dominated collectively and expansively activity*. This historical type would be very difficult to be built, though it would have an important role when theorizing on the routes that the development of an activity can follow. In this type of activity, work teams have autonomy to establish ways to operate, which would motivate the emergence of innovations that could rebuild the activity system through changes in the planning, the implementation and in the very conception of the object. Therefore, the collective development of the activity would become part of the everyday practice of its participants.

The implementation of this stage of development of an activity would be closer to a horizon to understand the ways in which the conflicts and reformulations lead the activity than to a conscious goal stated by its participants. Therefore, instead of analyzing historical processes to identify such activities, it is more useful to try to understand the emergence of innovations signaling such direction.

In the educational field, an example of experience trying to decentralize decisions in an environment of increasingly complex interactions is related to what became known as "democratic schools". Although there is a great diversity among institutions using this term to define their pedagogical and management proposal, in general, we could

characterize democratic schools, or free schools, as those in which students have great freedom in the choice of activities they wish to engage in their educational process. Teachers would assist, instead of guide, the development of such activities. In addition, school management procedures are set by teachers, students and staff who would have equal rights to participate in decisions. (PACHECO, 2008) However, it should be said that these experiences have been mainly found in primary education. In the case of technical education or technical and scientific higher education level, where the educational paths often have a more rigid structure than the general ones, the experiences along the lines of democratic schools would impose interesting pedagogical challenges. Their overshoot would surely bring contributions to all teaching levels. But this is still a “hypothetical construction” which, incidentally, is in line with the notion that Engeström characterizes as activities dominated collectively and expansively.

### **Final Considerations**

The constitution of the modern educational systems evolves in close connection with the needs of the industrial capitalism production, adjusting in the end to such requirements. Thus, the development of their teaching-learning processes, its curriculum, its practices in general, were shaped up in order to better respond the needs of a society based on a technical development increasingly specialized, required by the existing mode of production.

These expectations regarding the knowledge, combined with the massification process of school education that is intensified in the twentieth century since the end of the Second World War, are factors that had a strong influence in shaping the cultural values and bureaucratic structures governing the schools today. Thus, the educational process which should have a broader character in the integral educational of individuals, as suggested by enlightenment philosophers themselves, had become increasingly focused on the technical and scientific training.

Thus, on the one hand there is an expectation that the educational process, in general, would assist the subject in their comprehensive education while being aware of himself/herself, the world and the society where he/she lives. On the other hand, there is a demand for an education that is, even implicitly, applied in the immediate technical education, or allowing the individual to continue their professional education at another level. If the school becomes an indispensable way to the democratization of knowledge, what is such knowledge which is necessary for the individual, which are the motives of its teaching and how it should be realized, will depend largely on the demands and expectations historically constructed and socially accepted in face of the process of schooling.

The choice made by a society whether providing students in his schooling process with more general education or specialized technical education, motivates the emergence of some internal contradictions in the educational environments, especially in the basic education. If we investigate how the school curricula are being formatted over the years, we realize that even the attempt to reconcile both perspectives within the education system result in a preponderance of the contents related to technical and scientific education over those related to a classical humanistic education. Even proposals of approaches aiming at a more contextualized education on this topic often do not question the importance of certain topics which are present in school curricula while preparing individuals for citizenship.

Thus, pedagogical proposals that do not meet this historical reflection are at risk to reproduce judgments and meanings given to education in a specific historical moment, that would be reflections of a dominant ideology that produces the social meanings attached to the teaching activity at a certain period of time.

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