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The Limits of Modern Western Science (Moderniojo Vakarų mokslo ribos)

Santrauka. Švietimas, o pirmiausia – formalusis švietimas, yra svarbus modernėjimo ir globalizacijos komponentas. Tai rodo, kad visuotinis žmogiškų problemų sprendimas esti būtina nacionalinių ir tarptautinių santykių supratimo sąlyga. Demokratijos ir gerovės plėtra pasaulyje remiasi formaliojo švietimo reikalavimais. Tiek vadinamosiose išsivysčiusiose Vakarų šalyse, tiek ir siekiančiose tokio išsivystymo visuomenėse esamas švietimo lygmuo pasitelkiamas kaip vertinimo kriterijus.

Šiame straipsnyje nagrinėjamos dabartinės teorinės, metodologinės ir civilizacinės švietimo problemos, siejamos su globalizacija. Taip pat svarstomi Vakarų moderniojo mąstymo, kuris laikomas „globalizuojančiu“, klausimai, o taip pat aptariamos postmoderniojo multidiskursyvumo galimybės sprendžiant švietimo problemas, kurios atsiranda dėl globalizuojančio modernybės modelio poveikio pedagoginėje praktikoje.

Introduction

Education, and above all formal education, has been one of the principle components of modernization and globalization. This is to say that the notion of universal participation in human affairs is by now regarded a necessary condition for national and international relationships and understanding. Without education, as a rational condition, such relationships and understanding are hardly possible. The call for extension of democracy and the production of the good life around the globe is constantly premised on the requirements of formal education. It is deemed that peoples, whether in the so-called advanced world or the world to be developed, must constantly be judged on the basis of their level of education. We note that educational levels comprise the criterion for the character and abilities of a given nation and a civilization to which a nation may belong. Each one is then asked to improve the educational conditions in order to either catch up to or surpass the others. The current preoccupation with all sorts of health issues around

the globe is an example where education is necessary for all peoples to understand the “scientific” aspects of health and prevention of the spread of “disease.” Hence it is advisable to disclose what constitutes this modern education and what sort of human being and a type of reality does it require and in fact construct. While the phrase formal education sounds intellectual, indeed enlightening, we want to argue that such a designation has a preunderstanding that frames the modern Western civilizational understanding of sciences and by extension of human sciences. Indeed, it shapes the way in which human beings must become in their concrete, practical interrelationships, whether intra or international. What we are suggesting is an epistemic import of formal education that does not designate some pregiven reality, but a way of learning what would become practically, productively, and even ideologically efficient. This is to suggest that underneath the innocent sounding notion of formal education for all, there is another, tacit frame-

work that dominates both intellectual and daily life. It is essential to start with the way that modern Western sciences are providing a frame for modern Western modernity and its claim to be universal-objective civilization. To speak in a precursory way, this universality produced results that are counter to its intentions, specifically with respect to human sciences, and more generally as a violence to the humans as humans. One task is to show what kind of world understanding modern Western modernity has constituted that raise serious issues facing human sciences and also other human civilizations and their symbolic designs. Thus, scientific methodology and its understanding of the world must also be delimited, since they enter conceptions of what constitutes global higher education and, if at all possible education as human sciences.

This essay is designed to explicate the current theoretical, methodological, and civilizational problematic of education in globalizing process. The explications will include the relevant issues concerning Western modern thinking that has become regarded as “globalizing.” The latter will be addressed in terms of scientific enlightenments and its concrete implications and instantiations in educational praxis. A parallel theme, called “postmodernity” will be mentioned as a way to avoid the problems in education that arise with the logic of globalizing modernity in pedagogic practice. This will lead to the notion of multi-discursivity and the manner in which such multi-discursivity became understood as arbitrary construction.

The implications of postmodern multi-discursivity will be addressed as a presumed legitimating of the marginal discourses, inclusive of the cultural others. Yet it is impossible to reject modern Western scientific position by a mere rhetoric of postmodern multi-discursivity; after all, the results of sciences are too pervasive in every corner of the globe. Thus, to test the limits of globalization, modernity and its postmodernity has to be investigated in terms of their ontological and metaphysical status, and the way they are proliferated across educational systems as science. Only then the question of the future of the human sciences and the subject of such sciences can be addressed.

This requires an investigation of other kinds of subjects the other civilizations possess and raise the question whether such subjects have been, or indeed can be, deconstructed by the globalizing modernity and its attendant postmodernity. There may be other forms of “reason” that provide a broader and more basic framework for human sciences. The option, here, may be the extension of postmodern awareness that includes the other without subsuming the other under Western postmodernity.

This also means that there must be an understanding of what the others are “in their own words,” and therefore, what pedagogical role – curricular and standard wise – they must play. In this context, different conceptions of “history” will come into play. First, it becomes important to suggest how Western modern history, as teleological, appeared and disappeared. Second, other civilizations need not be “historical” in the modern Western sense and hence may provide a different framework for humanities. Third, Western globalizing modernity, and its postmodernity offer a structure of history as if it were universal and demand the rest of the world to accept it as true. After all, in order to become educated and enlightened, the others must be swept into the modern history in order to make scientific and human progress – with all the attendant problematic of progress, humanization, and domination over the world.

GROUND OF MODERN WESTERN SCIENCES

The birth of Western modern modernity may be discussed in various ways and under different categories: sociology, theology, theoretical prejudices, ontological grounds, and metaphysical conditions. These ways of accessing the entire domain of Western modernity are undeniable; the immediate task nonetheless, is defined by a reflective requirement. Most diverse philosophical and theoretical trends in contemporary West have defined the nature of reason – indeed its very essence – to be instrumental. Given this pervasive claim, we are compelled to reflect from it and to decipher the birth of modernity that would comprise the condi-

tions for the final emergence of this type of rationality. To speak in accordance with historical hermeneutics, the truth of a particular thesis might show up “much later” even if the founders of such a truth would not have recognized its presence. This is to say, various modern theoretical moves intimated instrumentality of reason, even if they have not presented the arguments that were the foundation of their implicit claims.

Numerous disciplines, such as history, economy, archeology, and in part philosophy, have contributed to the understanding of the development, composition and role of instrumental and technological thinking. Without denying such contributions, a focus on the specific mode of awareness – ontological – will best open the problematic of the modern/postmodern thought and the subject as individual with pure and unrestricted will. The following are essential factors that comprise the arguments, leading from one, the classical, to another, the modern, mode of awareness.

1. The rejection of the classical, basically Aristotelian, notion of a substance as a **WHOLE** possessing its own attributes, beyond those of the attributes of the parts of which the whole is composed.
2. The arguments leading to the primacy of reflective thought and hence to the primacy of the subject as the foundation and validation of theoretical and methodological avenues to objectivity. In turn, these arguments lead to a “voluntaristic individualism” and the primacy of self-determination. The success of these arguments is premised on the abolition of the whole and the positing of parts as the primary ontological components of nature.
3. The arguments of (1) and (2) lead to the conception of material-atomistic reality that is not accessible to perception, but only to a subject as calculating reason. The result is that whatever is deemed to be real, must be established, synthesized, worked over and shaped by the various activities of the subject. Some aspects of this trend are obvious in Kantian synthetic thin-

king, in Lockean and even Marxian notion of the labor theory of value, and even in Hegelian conception of the absolute idea as working itself through history to self-realization. It is also to be understood that the globalizing processes are premised on tacit reflectivity and not on direct empirical “data.” The reflectivity appears in the very notion of argumentation that posits certain ontological and metaphysical pre-judgments as “reality in itself.”

WHOLES AND PARTS. The problem of the whole and parts is concerned with the question of the ontological priority of the whole over the parts, or of the parts over the whole. This question includes the issue of the attributes of the parts and the whole: does the whole possess attributes of its own, as a whole, or do its attributes equal the sum of the attributes of the parts? The modern resolution of this issue comprises the ground of instrumental reason and indeed of technological conception of the environment and – finally – of the human. What then is the issue?

Greek thought had brought to light a fundamental theoretical issue. A substantial entity, composed of parts, must be either an aggregate, like barely and wheat in a barrel, or the parts must be blended into a unity. If the first position is true, then the substance as a whole, cannot possess attributes beyond those of the parts. If the second position is true, then the whole can possess attributes which are more than the sum of the attributes of the parts. Using a modern example, the problem can be formulated as follows: either water, and its attribute of wetness, is the basic unit of nature, or the parts, hydrogen and oxygen, with their specific attributes, are the basic elements of nature. Since these elements do not possess the attribute of wetness, then their aggregation, to form water, should not possess wetness. In this case the whole is equal to the sum of its parts and their attributes. But in this sense, the attribute of wetness of water is an ontological mistake.

The other side of the argument is as follows: if the parts are unified into a whole, then they cannot retain their individual attributes. If they were to retain such attributes, the result would not be a who-

le with its own attributes, but an aggregate, a sum of discrete parts. To form a whole, the parts must vanish as individual components into the whole in order for the latter to possess its own attributes. Here we have a dilemma, and Aristotle offered a specific solution to this dilemma. He argues that not only the parts, but also their attributes, cannot disappear entirely. If this were the case, then there would be no unification of parts into a whole, but a destruction of one set of substances and a creation of an entirely new substance. This makes no sense. To make sense, Aristotle posits the following: (I) there must be a unification of parts into a whole; (ii) the unification cannot be a mere aggregation, since in such a case there would not be a whole with its own attributes, but a sum of attributes of the parts; and (iii) the parts and their attributes cannot be completely destroyed and a new substance generated, since in that case there would be a creation of something from nothing. It is absurd that something could come from nothing.

The basic problem that had to be solved is this: how is it possible for the parts to exist in a whole without losing their individual substantiality, and how is it possible for them to retain their individual substantiality without the whole being a mere aggregate? If the latter case were true, then the attributes of the whole would be mere appearances. As one can readily see, this prefigures the modern distinction between secondary and primary characteristics, and, by implication, the subject-object division. Aristotle, meanwhile, attempted to solve this dilemma by a distinction between potential and actual existence. Since some things are potential while others are actual, the parts, combined in a whole, can in a sense be and yet not be. The whole can actually be other than the parts from which it had resulted, yet the parts can remain potentially what they were before they became combined into the whole. In turn, the attributes of the whole are potentially in the parts. Those attributes become actualized when the parts are unified into a whole. With the unification, the attributes of the parts become potential. These arguments led Aristotle to claim that a whole composed of parts can have its specific attributes and be regarded as a basic onto-

logical unit. This also implied other levels of “reality.” For example the state, while composed of individual citizens, is more than the sum of the interests of the individuals.

While this solution lasted throughout the medieval period, it was already challenged by Arab philosophers. The challenge points to a difficulty of the potential existence of the parts in a whole. If such parts become potential, then the whole is composed of potential parts. Yet it makes no sense that an actual whole is composed of potential parts. If the whole is actual, then the parts must be actual. Yet, in turn, if the parts are actual and retain their individual characteristics, then the whole is a sum of the parts, an aggregate. Once again, the attributes of the whole must be appearances, and appearances require a subject. Given this irresolvable dilemma, the thesis of the ontological priority of the whole was rejected, and a theory of the parts – atomistic – was accepted. It was granted that the basic ontological unity is a material part that cannot be altered or destroyed in the whole. This suggests that if the whole is a sum of parts, then there is no unity of a whole; everything is an aggregate of material parts in space and time. The visible whole and its perceived attributes have no objective basis. What is perceived directly must have a “place,” and this place was designated to be a subject, containing the secondary qualities, while the real objective world, was composed of primary, quantitative measures.

The consequences of this ontological decision were well developed by Galileo in natural sciences, and by Hobbes in social and political sciences, and accepted by Descartes as the ground of his dualism. The perceptible – qualitative – attributes of the whole are not only appearances, but are dependent upon the states of the experience. Since the atomic parts possess their attributes that cannot be altered, the whole is a numerical sum of the parts. Hence, any qualitative features of the whole are actually features of perceiving subject. In turn, this means that what the subject perceives are not attributes of the real, while the real, the atomic parts, cannot be experienced. In short, reality in itself is inaccessible to experience. Thus, one needs to devise an access to this reality by other means. This, by

the way, is the birth of modern Western subject – a mind that thinks its own thoughts – and a will that determines what thoughts shall count for science.

It must be pointed out that while the modern choice of nature as a sum of material parts has been a dominant trend, sciences and indeed human sciences are in a constant quandary to understand characteristics of things that are different from the characteristics of the parts. All that scholars in various disciplines can come up with is a thesis of “emergent properties.” As is well known, this thesis dominated the dialectical thought of the 19th century and appeared again in biology, genetics, and even social and political sciences. Hence, the modern Western scientific thinking is constantly facing its own limitations. It cannot derive the “more” in nature than the thesis of a sum of parts would allow.

REFLECTIVE CONSCIOUSNESS. Perceptual awareness offers no access to the modern reality. Such an experience belongs to the subject. The question that must be answered concerns the access to the new ontological components, the atomistic parts, as the basic reality. The sole avenue that is open rests with the theorizing subject capable of reflecting upon his own thought and positing specific features of such thought as criteria for objectivity. Reflective thought, therefore, becomes the ground for knowledge. But it must be pointed out that the modern movement toward reflective consciousness did not stem from Western religions, such as the Christian notion of internal soul, but in opposition to it.

The self reflective thought was a result and an inevitable conclusion of the parts and wholes debate. Shifting the awareness of the attributes of the whole to the region of subjectivity, also demonstrates the new type of reflective consciousness. While classical antiquity, and in general the medieval, understood vision in terms of the visible, and the human as part of nature, modern thought understands the visible in terms of humanly selected mode of vision, and the human as different from nature. Thus, while the parts-whole controversy led to the selection of ontological atomism, resulting in the subjectiveness of perceptual awareness, it also posited the subject as totally distinct from, and unaffected by the “external

world” of matter. Here, self-consciousness constitutes itself not because of, but despite all powers external to it. Self-consciousness is also a self assertion of will against all powers and causes.

A concrete understanding of self assertion requires a sphere of objectivity that is methodologically and practically within the range of epistemic and power influences of the subject. The latter is designed to be in a position to judge everything in light of its methods and power. This requires a strict ontological distinction: the same thing can be regarded in terms of its own reality, or as constituting a sphere of objects for us. This distinction is based on reflective consciousness that shows that the objects, stripped of their own qualitative presence, can be objects for our own methods and powers. The question then arises, what types of methods, and what powers are ontologically relevant? First, it is to be noted that a direct awareness is excluded from being a basis of access to reality. Such an awareness is relegated to subjectivity. Second, the objectivity, being purely a sum of parts, can be accessed by measurement – quantitatively. It is obvious that by modern definition of objectivity and subjectivity, quantity is mathematical, cannot be an aspect of ontological reality. In this sense it must be subjective.

Here we face a condition specific to Western modernity: there are two subjective structures, one, the perceptual, and the other, the mathematical. Neither, by itself, can suggest what is objectivity. One mode is qualitative, the other is quantitative, and hence the only way to make a choice between them is on other than ontological grounds. On the surface, those grounds seem to be the search for clear and distinct concepts offered by mathematics. Yet it is not the case that mathematics can offer a direct access to the material reality without another, and more basic, component. The latter is, in principle, praxis laden, i.e. an active connection between the chosen mathematical thinking and the material reality. The connection is a bodily translation and application of the mathematical structures on the materially interpreted reality. This is to say, the subjectively conceived mathematical ideas can connect to objective world only through practical activity. The latter has many terms, such as “praxis,”

“application,” “experimentation,” and even “labor.” This basic conception is at the root of the labor theory of value.

What is important for pedagogy is the transformation of the notion of science and hence learning. On the grounds of modern ontology, it is impossible to seek knowledge for its own sake. At base, all knowledge is mediated by a selected method and its application, and application requires results. We are now in a position to articulate the essence of awareness of this modern transformation. First, everything that the humans encounter must be measured and, based on the manner in which measures are applied, future measures should be predicted. This is to say, we measure and practically arrange the material conditions and, on the basis of these conditions, can predict measurable results. Second, the logic of this process is basically technical and conditional: if we establish, by our activity, certain measurable material conditions, then we can also predict the results.

This is the source of the modern notion of “conditions – results” or “conditions – conditioned.” What is significant is that all sciences, inclusive of “human” sciences, have accepted this language. Psychology, economy, sociology, biology, etc. have taken for granted that knowing the conditions implies knowing the results. Third, knowing how to change the conditions is equivalent to knowing what changed results will occur and, in turn, positing specific material results also implies the construction of material conditions to achieve such results. This is a very unique phenomenon: the human is placed in a position to construct and calculate material results – results that need not exist in nature – and then to calculate the conditions that would yield such results.

Fourth, this context implies another aspect of modern human: arbitrary will. At this level, such a will is introduced to account for the notion that the “desired” results do not yet exist; hence they must be projected by a will that is not determined by anything existent. The future results are not yet given; hence they are projections of a will that must calculate and establish the material conditions to obtain what it has projected. This grounding constitution of the will is different from views that regard will as

a power to chose between existing options. This arbitrary will (a) invents and projects the options as something to be realized; (b) it selects a method – mathematical – how the conditions must be arranged; © it calls for an activity that would construct such conditions which would lead to the projected results. Fifth, the world, reduced to a sum of material parts, is regarded as qualitatively homogeneous: all things are made of the “same” material parts. Hence, one need not respect the qualitative distinctions between the so called natural objects, such as humans, trees, and stones; the differences are the measurable ways that the parts of which these objects are made relate one to another. Sixth, the method itself is qualitatively blind; one cannot decide purely mathematically whether something is human, red, rain drop, or a galaxy. And seventh, there appear two domains, the homogeneous, universal material reality that has no value, and a theoretical model that is mathematical, and hence equally value free. This is to say, we obtain a material ontology and mathematical metaphysics, expressed in modern terms as body-ethically and valuatively indifferent, and socially detached.

SCIENTIFIC REDUCTIONISM AND PEDAGOGY. All events are analyzable into the smallest components of which they are made. In this sense, higher education must operate analytically and offer methodology that can perform analytic operations. This means that in principle, if education is scientific, it has to be reductive. The result is quite dramatic: everything is made of the same material parts, and thus all parts can be made to replace all other parts: a metonymic understanding of science.

It must be emphasized that the metaphor of “atomic parts” disregards all differences between biological, chemical, physical, living, and inanimate, and posits the notion that at base the living can be replaced by inorganic-plastic, the biological can be analyzed into and designed by chemical combination of parts, and the psychological (the soul) can be reduced to bio-chemical balances and imbalances. It is taken without any questions that the human is a physical entity composed of physical parts, and that such parts are replaceable by other physical parts: the heart is a pump, and if it fails, it can

be replaced by a plastic pump. Thinking is a DNA process in the brain, and if some part fails, it can be replaced by an implanted chip.

In principle, everything can be made into everything, as soon as we can establish the requisite material conditions and find ways to assemble the various parts to accomplish desired results.

It seems that this process of quantitative analysis of everything into parts, their calculated compositions and endless possible recombination creates a view that scientific technology is MAGIC. Magic once was regarded as an ability to make events happen by incantations, rituals, and above all, proper words. But modern scientific technocracy is a magic with endless abilities to make everything, to transform liquid into material, chemistry into feeling, electromagnetism into thought, and a plain girl into a star. This magic will be explicated shortly in terms of the proliferating "scientific" disciplines, and above all their multi-discursive incantations empowered to make whatever we desire – but at a price: the human must disappear and become an object of material transformation, chemical readjustments and bio-genetic reengineering.

Nonetheless, we should not be blinded by the psychological, and even human term, "desire." The term is equally reducible by science to bio-chemistry and genetics as "facts" which would account for desires. Thus, our love is not a human state, but a way that the genetic material propagates itself. Love, as desire is not measurable, but genetic combinations are measurable and can be transformed to

establish diverse desires. The latter are subjective and scientifically irrelevant, while the former are "reality" and give us the truth. The point is that the preeminent language in postmodern theories of "desires" and even "powers" that move our actions, is not scientific; desires cannot be experimentally controlled and predicted. In order to obtain what would be deemed appropriate desires, technically constructed material (bio-chemical) conditions must be established.

As is well known, this reductionist syndrome is the context of the entire modern Western civilization. It is used in all human sciences and even on a grand scale in social experiments, such as socialism and capitalism. The Soviet Union, following this civilizational logic attempted to design an entire society on the basis of "conditions – results," such that all events are results of material conditions, inclusive of humans; if we wish to have a "new humanity," we must establish material conditions that would cause the appearance of this new humanity. This is no different from behaviorism and its claim that all our actions are results of material conditions. If we want to change human behavior, we must change the conditions. Of course more severe reductionism occur in human sciences when they too wish to become "scientific" and offer "factual explanations" of a specific discipline. To understand this effort by human sciences, it is necessary to expand the modern awareness toward "instrumental rationality" that bases human sciences.

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