

EDUCATION SCIENCES: TOWARDS A THEORETICAL REBIRTH BEYOND REDUCTIONISMS

*Ciencias de la Educación: hacia un renacimiento teórico
más allá del reduccionismo*

*Sciences de l'éducation: Vers une renaissance théorique
au-delà du réductionisme*

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RESUMEN

Con el fin de clarificar la dirección que las Ciencias de la Educación pueden tener en un futuro próximo iniciamos el artículo discutiendo la situación epistemológica de la educación, y articulamos esta discusión con la evaluación del impacto de algunos de los factores externos determinantes. Seguidamente se presenta la línea que siguió la Modernidad en las configuraciones de la educación racional de la razón y el impacto de la fractura interna de la razón forjada por la Posmodernidad, lo que nos lleva a concluir con los subsecuentes requerimientos epistémicos y

normativos para la teorización de la Educación. Con la intención de evitar el reduccionismo, proponemos una metateoría triangular que sea capaz de dar cuenta de la compleja irreductibilidad de la educación. Lo que configura un campo integrado por tres dimensiones en donde las Ciencias de la Educación comprenden, primero, las dimensiones hermenéutica y especulativa, cultivadas por la filosofía y orientadas hacia el establecimiento de valores y metas para la acción; segundo, una dimensión descriptiva y explicativa, común a las ciencias sociales; y, tercero, una dimensión de carácter operacional y tecnológico, que trasciende la mera racionalidad técnica confinada a la selección de medios y la operacionalización de metas, de donde se infiere una búsqueda del acuerdo subjetivo que pueda crear consenso en la normatividad deontológica reguladora de la actividad profesional del educador, su papel como agente libre y como recurso para la acción y el cambio.

Palabras clave: Ciencias de la Educación, metateoría, epistemología, Posmodernidad.

SUMMARY

In order to clarify the directions that Education Sciences may take in the near future we start by discussing the current epistemological predicament of Education, and then articulate this discussion with an assessment of the impact of some major determinant external factors. We proceed by presenting the thread of Modernity in the configurations of educational reason and the impact of the inner fracture of reason fostered by Postmodernity, which leads us to conclude with the epistemic and normative requirements for theorizing Education. To avoid reductionism, we propose a triangular metatheory that should be able to account for the irreducible complexity of education. It presents a three-dimensional field where Education Sciences comprise, firstly, a hermeneutic and speculative dimension, cultivated by philosophy and oriented towards the setting of values and goals for the action, secondly, a descriptive and explanatory dimension, common to other Social Sciences, and thirdly an operational and technological dimension which surpasses the mere technical rationality confined to the selection of means and operationalization of goals, and therefore is in search of an intersubjective agreement that builds a consensus on the deontological normativity that regulates the activity of the professional educator, in its role of free agent and as a resource for action and change.

Key words: Education Sciences, metatheory, epistemology, Postmodernity.

SOMMAIRE

Afin de clarifier les directions que les Sciences de l'éducation peuvent suivre dans le futur proche, nous commençons par discuter le statut épistémologique actuel de l'Éducation pour articuler, ensuite, cette discussion avec l'évaluation de l'impact des principaux facteurs déterminants externes. Nous procédons encore à l'identification du fil rouge de la Modernité à travers les diverses configurations de la rationalité éducative, et analysons l'effet de la fracture interne de la Raison produite

par la Postmodernité et qui nous invite à conclure avec les exigences épistémiques et normatives pour théoriser l'Éducation. Pour éviter tout réductionnisme nous proposons une métathéorie triangulaire qui devrait être capable d'accueillir l'irréductible complexité de l'éducation. Cette métathéorie présente un espace tridimensionnel où les Sciences de l'éducation englobent, tout d'abord, une dimension herméneutique et spéculative, cultivée par la philosophie et orientée vers la définition de valeurs et de fins pour l'action éducative; deuxièmement, une dimension descriptive et explicative, commune à d'autres Sciences sociales; et, finalement, une dimension opérationnelle et technologique qui dépasse la simple rationalité technique, confinée dans la sélection de moyens et l'opérationnalisation de buts, et de ce fait même vise la constitution d'un accord intersubjectif qui puisse fonder un consensus sur la normativité déontologique qui régule l'activité de l'éducateur professionnel dans son rôle d'agent libre et en tant que ressource pour l'action et pour le changement.

Mots clés: Les Sciences de l'éducation, la metatheory, l'épistémologie, le Postmodernisme.

1. INTRODUCTION

Education Sciences underwent an epistemological campaign that led to a meta-reflection about the forms of scientific research pertaining to Education in which multireferentiality has evidently become the dominant paradigm. Yet multireferentiality does not translate itself into any kind of undifferentiated amalgam of distinct disciplinary approaches. This process results from the understanding that multidisciplinary fails as a reliable epistemic compass capable of converting transdisciplinarity into an essential explanatory framework within Education Sciences. It follows that we should recognize the multifaceted rationality that is deployed by Education Sciences in their discursive constructions. In fact, by elucidating the diverse nature of these distinct rationalities we can also explain the evolution underlying the replacement of the concept of Pedagogy by the compound notion of Education Sciences. Currently, and without denying the failure experienced in practice that is partially attributable to various extrinsic factors, it is crucial that the theoretical discourse revolving around Education could not only overcome trivialization but also produce a robust self-legitimation capable of clarifying the strongly conflictive and dialectical nature of this field of knowledge.

With regard to Social Sciences, namely those exploring the realm of educational issues, we witness a sharp polarization between, on one extreme pole, the advocates of a purely instrumental rationality –who are likely to plead for a model of efficiency-oriented instructional practices– and, on the opposite pole, those who believe that educational practice, being almost equivalent to an art, is first and foremost determined by purposes, and therefore can hardly be modelled by any instrumental rationality. Certainly one must admit that the epistemic legitimacy of Education Sciences never excludes the practical dimension of a rational operability,

properly understood in the light of various educational readings and approaches. However, it is also true that Education Sciences involve three dimensions: firstly, a speculative-hermeneutic dimension, inherent to philosophy itself, which raises questions about the values and purposes of the educational action itself (Amilburu, 2012); secondly, a descriptive-explanatory dimension, shared with other Social Sciences; and finally an operative-technological dimension that, going beyond the mere technical rationality of the choice of efficient means, cannot but reach a broad agreement and achieve intersubjective consensus on the normative ethics that constraints the professional educator as an agent of change and a resource for action.

In coping with current challenges, Education Sciences must more than ever justify their criticism of the technological paradigm taking into consideration the teleological standpoint. This entails the acknowledgement of the increasing urgency for an understanding of Education that moves beyond theoretical reductionisms, even if in the meanwhile the allocation of research funds and other resources for scientific development is subordinated to the dominant ideology that tends to impose its own criteria of performativity. In addition, the technocentric thinking brings with it a composite reductionist vision of human life that encompasses a model of society, an idea of education, and even a conception of knowledge, where the essential value lies in a narrowed understanding of «usefulness». Such a vision establishes a dystopian land governed by the masters of efficiency and effectiveness. That is why it becomes increasingly difficult in so bounded a place to hear the voices that speak a non-instrumental language when thinking of Education (Smeyers, 2010).

The questioning of the status to be assigned nowadays to the educational activity, from the standpoint of the fields of knowledge that underlie, interpret and determine such activity, reflects undoubtedly the need for rethinking the pedagogical discourse, not only in its pragmatic and technical dimension, but also in its elaborations of teleological functions. By pointing directly to the fulfilment of a utopian vision, that is to say, a more just and peaceful society of free men, the postmodern reflection proposes a relativization of the contemporary pedagogical discourse, and invites one to regard with suspicion the scientific claims for objectivity scientific. However, by the same token, the postmodern critique renders more visible the need for a new meta-discourse on education that might be able, on the one hand, to put into question some of the tenets of postmodern thought, and, on the other hand, to revitalise the scientific inquiry of the new social configurations that challenge education and the school. Given that educational activity develops within a dialogical tension between the desirable and the possible (both in its relational and institutional level), the scientific metadiscourse that deals with it cannot avoid conjoining and fusing two different layers of reflexive interpretation that evokes the «double hermeneutics» propounded by A. Giddens (1993) as a new methodological rule. At the first hermeneutic layer, the educational metadiscourse attempts to interpret a dynamic reality that is co-constructed by that same metadiscourse,

although there is an ontological thickness in reality that resists and overflows all discursive construction; at the second hermeneutic layer, the discourse refers to its own inner structure and discursive genealogy, providing an ideological and historical self-reflexivity on the web of representations that pervades educational phenomena.

Broadly speaking, this heritage of reflexivity may be located around two traditions of knowledge, namely the theological and philosophical tradition, historically the oldest, and the scientific tradition of more recent origin but that bestowed a scientific status upon Education that only a few dare contest presently.

The complexity resulting from this bicephalous origin refers to different dimensions that, nevertheless, must be unified so that educational action may reassert itself in its originally axiological intention. Indeed, the so-called «educational crisis» stems from the inability of the institutional system to adequately respond to a mass education, an inability intrinsic to this system, but it is also related to the axiological disorientation and to the hypostasisation of uncertainty that constitute the experiential hallmarks of our times. There is no doubt that the «Death of God» as a cultural idea, pre-announced by F. Nietzsche (*Gay Science*, §. 125) to mean the annihilation of the possibility of a reference to any absolute ontological and axiological structure which could establish a solid conceptual hierarchy to interpret and assess human historical endeavours, has deeply weakened and rendered more diffuse the anthropological framework in which modern Western rationalist humanism had been grounded.

Using J.-F. Lyotard's (1979) phraseology we can say that in the past the sense of history and human life was enshrined in religious, philosophical or ideological metanarratives that cemented social cohesion, providing unambiguous anchors for educators (either teachers or parents) for the meaning of their action. At present, that is, in our supposedly postmodern age, those metanarratives that had once organized and stabilised collective thinking appear now to have lost their foundational power. It is thus unavoidable that the very educational discourse enters a self-critical movement in which it relativizes itself by means of a certain dilution of a monolithic religious thought combined with a certain philosophical and epistemological deconstruction that eroded the ancient landscape of the rationalist-positivist paradigm, and led to the development of the scientific fields that support Education Sciences.

Education Sciences form a multidisciplinary body of knowledge that aim, at the same time, a strong degree of unity in explaining and understanding the educational phenomena. Without this epistemic unity, the various approaches solicited by the complex reality of education would melt into air and even the disciplinary autonomy of Education Sciences would vanish and loose their own specificity. Although Education Sciences have not adopted a strict descriptive and experimental program, they have succeeded in gaining increased visibility, owing to their pragmatic sense. Educational theory, for its part, aims to impact on the educational reality in order to optimise it under the actual conditions of their existence. In this

sense, and without denying the positivist rational self-discipline that is fundamental to the diverse scientific approaches to educational phenomena, it becomes impossible to theorise education in all its breadth if one ignores the axiological and normative references that convert the intention of educating into a formally planned intention in accordance with purposes and values (Touriñan Lopez, 2012)¹.

2. THE «RED THREAD» OF MODERNITY IN THE CONFIGURATIONS OF EDUCATIONAL REASON

As is commonly recognized, the scientific discourse on education was born in close connection with the emergence of the New Education movement which incorporated in its reformist intentions the principles of freedom and autonomy that typify modern secular thought. Indeed, even if one acknowledges the normative, prescriptive, and supra-historical reification of the very concept of modernity made by many theorists, one must consider, nevertheless, that it was the Rational revolution of eighteenth century Enlightenment which unleashes an extensive and consistent process of change in the Western world, implying a thorough mutation in the cultural discourse on the individual and society. It is true that Renaissance had already designed a new concept of individual and rationality which denoted a rupture with the theocentric perspective of medieval culture. For the return to the main original sources of classical Greek and Latin philosophy had allowed Renaissance scholars to rediscover the excellence of a culture that had developed independently of any supernatural authority. Owing to this pervasive classical influence and without obliterating an idea of God that comprises the absolute power

1. Education theory may be understood in different ways and having different scopes: for OLIVA ORTIZ (2008) the metatheory of education must be taken as a critical philosophical reflection that expresses the deep scientific structures and refers concurrently to a teleo-axiological framework in order to propose an educational profile of radical human authenticity for the development of a given historical moment. The author considers four different meanings for the metatheory of education: a) the hermeneutic of the scientific subject-matter, which elucidates the understanding of human being; b) the elaboration of a synthesis of scientific criteria; c) the making explicit of the nomothetic principles of the human and educational «ought-to-be»; and d) the understanding of human being in a concrete existential and historical framework. Metatheory, globally considered, must provide the vision of the conditions for the development of an authentic, autonomous, free, happy, democratic, caring, and inclusive human being. In keeping with these ideas, GIL (2011) distinguishes theory oriented to practical and instructional engineering from theory focused on desirable and valuable educational ends. This entails to draw a distinction «sin posiciones extremas, ni excluyentes, ni juicios valorativos o jerárquicos, la investigación educativa centrada en la enseñanza y la ayuda educativa, de la investigación educativa generadora de conocimiento general sobre la educación» (GIL, 2011, 32). Acknowledging the impact of the pragmatic turn in the 1980's, carried by CARR (2006) among others, we must take into account the critical standpoint, assumed then by WALSH (1993), highlighting the fact that the loss of horizon in education requires the safeguarding of a metatheoretical perspective. This is why, in line with SÁEZ ALONSO (1994), we also emphasize the need for educational metacriteria ou metaprinciples.

of creating and sustaining the universe, Renaissance asserts the supreme value of the individual and of temporal action that originates in human initiative. In this historical movement of emancipation of the individual and secularisation of culture, the free spirit and the institutional schism of the Protestant Reformation in the sixteenth century fulfilled a very formative function, because the Protestant principles deny the authority of the Church as a mediator between God and personal consciousness, and affirm the holy nature of individual freedom and entrepreneurship, paving the way for modern rationalism.

On emancipating man from the tutelage of theology, modern culture establishes experience and reason as the only legitimate sources of knowledge and, therefore, these sources appear as paradigmatic of the constitution of the new spirit in the seventeenth century emblematically represented by Baconian experimentalism and the Cartesian *cogito*. If the Copernican theses have produced a radical transformation of medieval cosmological assumptions, dethroning mankind and planet earth from the centre of the Universe, the manifestation of the uncertainty inherent to the medieval world became equally compelling through the cognitive construction of Cartesian philosophy that embodies methodical doubt. When he refuses the character of absolute self-evidence to all possible truths except his own existence as felt through thought, Descartes did nothing but reinforce in a decisive way the emancipation movement of Reason that is characteristic of the historical trajectory of modernity and achieves a remarkable expansion in the Enlightenment. The metaphor of light, with all its evocative power, was used during the eighteenth century to denote the new outlook that «displays in action not the speculative and contemplative reason of the classical concept of science, but rather the dynamic and paroxysmal reason that intervenes to transform all spheres of human life» (Pereira, 1989, 29).

This belief in the transformative power of reason and in its applicability to the various areas of human activity is clearly visible in the concept of *Aufklärung* (Enlightenment) proposed in 1788 by A. Riem, which describes the enlightened reason as «the effort of the human spirit to bring to light all the objects of the world of ideas, all human opinions, and their results and all that influences mankind, according to the principles of a pure doctrine of Reason for the increase of what is useful» (quoted in Pereira 1989, 34). As is maintained by this definition, Enlightenment does not take tradition for an authority, intending to submit to the test of reflexive analysis all human productions, in order to liberate the individual from the mental chains that provoke his minority and hinder his progress. Consolidating the intellectual essence of modernity, the notion of historical progress that emerges from the eighteenth century transforms profoundly the vision of time, for it begins to be construed as unrepeatable and irreversible, and configured by the action of free agents. Deprived of a ultimate end determined by a divine Providence, history begins to be conceptualized as the locus of the progressive development of Reason. And if, at the biological level, under the influence of the evolutionist model of the nineteenth century, the human subject begins to perceive himself as the

result of a given animal evolution, at the sociological and cultural level, the very idea of education begins to be represented as a driving force of social and cultural progress that everyone must stimulate.

Unsurprisingly enough, the scientific discourse on education, born in close relationship with the New Education movement, expressed in its intentions and in its practice a reformist stance. The New Education intended to ground the pedagogical practice in solid psychological knowledge (namely, child psychology), and thus provoked in a very explicit manner an epistemic rupture with the traditional educational model that appeared to be clearly inadequate to the pragmatic needs and to the deeply rooted beliefs of progress of Western society at the beginning of the twentieth century. This rupture, designated as a «paidocentric revolution» in the words of Claparède, is carried out in favour of both scientific values and human values, that is, freedom and autonomy. The example of J.-J. Rousseau Institute is in this regard illuminating because they attempt to develop an experimental pedagogy, based on empirical data of psychology, while at the same time their educational effort is oriented toward a socio-political and moral end. In an explicit way, the scientific character that belongs to the writings on Education by Bovet and Claparède is always reconciled with an intention of social change in keeping with a normative rationality that actualizes the project of Modernity. Now, it turns out that the new technological, social and ideological realities which characterise the present times tend to fracture the assumptions of rationality, arousing new reflexive images of the individual and society. While in some of its aspects, postmodernity presents itself as the expiration of the Enlightenment utopia, it is expectable that it causes a sense of loss and «crisis», to the extent that many of our social representations and discourses become obsolete. Without ascribing to this crisis any apocalyptic significance, but trying to deepen and broaden its import through the very critical and reflexive inquiry that it provokes, we would maintain that we are bound to face to new challenges in the educational field which pertain to both the practices and the meta-theoretical discourses that justify the practical intentions.

3. POSTMODERNITY AND THE INNER FRACTURE OF REASON

If the postmodern experience marks our present times, the metaphysical suspicion that disaggregates the possibilities of conceptualising a unified reason, in modern philosophy, derives from Nietzsche's own destructive action that eradicates, with the much-vaunted «death of God», any transcendent foundation capable of embodying the unity between ontology and phenomenology. Once lost the ontological references that provided the foundation of our ordering of time and reason, we are launched without any possible salvation to the plurality of discourses that fragment and reverberate themselves, and lack a unifying principle that would transcend the temporal contingency of their formulations. In the unsecured labyrinths of nihilism that imprison us in the vertigo of time reduced to the momentum, the death of God threatens to clone and replicate itself in the human

subject, whose life becomes an inert function and instrument within the mere scope of the activities that man creates to which he offers wholly himself confined in the fugacity and voracity of the present moment. If it is not difficult to anticipate the postmodern landscape in Nietzsche's critical pronouncements, one should consequently realise that the «death of God» signifies at a logical level the death of that rationality that Nietzsche must also presuppose. Moreover, as the eschatological horizon and the sense of a unified human historical project have vanished because of the implosion of their timeless ground, Reason weakens itself, and the idea of a cosmopolitan mankind called to live a shared vocation becomes utter nonsense.

Orphaned of transcendence by Nietzsche's piercing lucidity, we can no longer perceive an intention to History beyond the scope of its own local narrativity, to such an extent that the plural interplay and the increase of overlapping between discourses become the new *topos* dealing with the idea of rational improvement and scientific advance. The «strong» all-encompassing rationality yields to a «weak» rationality (confined to the face-value of facts); and the latter offers now the ontological and anthropological matrix of our temporal deeds. In effect, once lost the sense of order and direction of historical time towards a transcendent purpose, the assumption of the contingent existential relativity of reason becomes the governing instance of our reflexivity irreversibly fragmented by the absence of a unifying principle. And the prophesised «death of God» brings also the death of a «pre-announced story», because the sense of unity of history is diluted in the vacuum of human space opened by the collapse of all transcendental principles that once bestowed order, unity and purpose to life in a meaningful and permanent way. For Gianni Vattimo (1991), modernity meets its epilogue when it eradicates the possibility of conceiving human history in a unified way. As a matter of fact, the movement of cultural secularisation that establishes the structure and configuration of modernity proposes a hypostatisation of the notion of Progress in which still resound the echoes of the eternal sacred order orienting human history, although in a utterly secular version. For, without an eschatological horizon and a transcendent criterion of value to guide the global interpretation of History as well as individual self-understanding, the contingent circumstances of lived experience provide the exclusive reference for meaning-making and for the assessment of human action. The fragmentation of the unified view of time and history constitutes the distinctive experience of postmodern age, and corresponds to the incredulity toward all «grand narratives» or «metanarratives» (Lyotard, 1979) and their replacement by a myriad of fragmented and local narratives obeying to an ontology of singular events. Whereas the metanarratives embodied the unity of a complex tissue of historical actions, the new postmodern style of self-storytelling celebrates disconnection, instantness and nonsense.

The process of grieving responding to the loss of these discourses of legitimation of modern rationality, whose totalising and universal aspirations were blatantly denied, its becomes the erring path of postmodern subjectivity who represents itself as an amnesiac spectator of History. In this heteroclitite drift of meanings

which technology threatens to make proliferate, changing our usual references to space and time, and to the identity of our own body, the modern *episteme* of a rationally and meaningfully examined life suffers a process of flexibilization and transmutation. Furthermore, the loss of ontological density of our virtual worlds makes one appreciate as seductively attractive the instrumental possibilities of new media technology that can create and recreate infinite worlds specifically designed to fulfil our narcissistic fantasies.

If, in many respects, postmodernity affirms itself as the new cultural landscape, such strong position proceeds undoubtedly from the multireferentiality of coordinates incorporated by the postmodern thought. In fact, the movement of economic and cultural globalization threatens to erode the diversity of plural discourses; and, likewise, the new communication technologies operate a spatial diffusion that dilutes the meaning of geographical location and the sense of belongingness to a place as a referential for the assignation of self-identity. However, it is hardly arguable that the expansion of this technical and instrumental rationality be the simple figuration of modern rationality submitted to the hierarchy of its symbols and values. Indeed, if apparently the modern technological utopias seem to favour an increasing flexibilisation and subjectivation of instrumental procedures, they also represent the culminating point of a process of derealization of our subjectively constructed perceptive senses. This happens through the anticipation of a universe virtually programmed with a hermeneutic objectivation of subjectivity. If the translocal subject thus succeeds to the supposedly universal subject of modernity, this is only possible by means of a sort of technology and economy that sustain the process of globalisation, and jeopardises the legitimacy of the process of identity construction of individuals based on their connections and practices in surrounding communities. In the past, the historical meaning proceeded from the real interdependence between social discourse and action, and the agents' rationalities conveyed representations imbued with the embodiment of the «dialogical» subjects. In contrast, presently new technologies give rise to the creation of spaces supposedly «neutral» that reify our thought processes and only apparently foster cultural hybridity. In this new cultural constellation, the dilution of a dialogical argumentative reason becomes self-evident, a kind of rationality that might safeguard an open inquiry aimed at respecting the radical alterity between discourses and reaching a mutual elucidation of alternative assumptions. In distinct ethnocultural landscapes, the concatenation of rational arguments surrenders to a clear preference for the exhibition of force. In line with that proclivity, the postmodern man seems to increasingly replace rational inquiry by the violence of action strongly mediated by technologies that can override the distances and make pluritopic the effects of local behaviours. If, instead of establishing a final universal liberal order, the announced end of History (Fukuyama, 1992) leads paradoxically to new images of political conservatism and subtler forms of violence that result from the eruption of the global in the local, it is high time to rethink the normativity that may appear as building legitimacy to educational theory, and reframing the pedagogical

discourse with regard not only to its pragmatic and technical dimension, but also to its teleological horizon.

4. EPISTEMIC AND NORMATIVE REQUIREMENTS FOR A THEORY OF EDUCATION

In fact, if the metanarratives of modernity that embodied the thought of modernity have currently lost their foundational status, it remains conceivable, nevertheless, that the pedagogical discourse still reflect the impact of the epistemological and axiological fracture that made tremble the rationalist paradigm in which the very idea of Education was embedded. Besides, one cannot neglect the fact that the emancipating efforts of the Enlightenment that aimed to promote the autonomy of moral subjects have inspired the New Education movement. Without giving up their enthusiasm and commitment for building a renewed school, one must recognise that, on the one hand, the new societal context, with its increased economic and technological demands that make the labour market more competitive, and, on the other hand, the emergence of a technologically-mediated school pose absolutely challenges to the educational process. At the same time, the old antinomies, always ubiquitous in pedagogy, are highly magnified by the postmodern fracture of rationalities. Indeed, the antinomies cross all the reflexive discourse on education and tend to shape it as an irreconcilable dichotomy opposing «socialisation» to «autonomy». Moreover, these antinomical tensions revitalise the increasing threats of social atomisation promoted by economic neoliberalism. Let us recall how Savater (2000, 6) emphatically formulates this issue: «Education should prepare competitors adapted to the labour market or form complete men? Should it strengthen the autonomy of each individual, often critical and dissident, or maintain the cohesion of society as a whole? Should it develop innovative originality or the traditional identity of the group? Should it focus on the practical effectiveness or opt for the creative risk?». And the truth is that, although the very process of modernisation had already intensified some risks inherent to the autonomy of individuals, it is in the midst of present fragmented identities that such risks become intelligible and extreme. According to Alain Renault (1998, 48), «given that the modern retreat of traditions deprived us of any reference to common predetermined directions, everyone must impose to himself a continuous process of foundation and revision of the norms by which he abides». If the radicalisation of individualism appears, therefore, as the mark and the core risk of present times by weakening the reference to collectively shared values, then it becomes imperative that in line with the rejection of totalising and monolithic visions, the pedagogical discourses also refuse an entire axiological relativization. For it would necessarily entail the collapse of all foundation for the very meaning of education.

Assuming thus that the school has to be reinvented in its own structure and function, we argue that this change will require a thorough rethinking of the status of education and knowledge in our postmodern societies. This means realising the impact of external constraints inherent in the societal changes that can be anticipated

from the expansion of vectors that are already present and that are likely to gain momentum. These vectors comprise first and foremost the new information and communication technologies which are not merely operational, but cause profound transmutations in all forms of cognition, knowledge, and social relationships (A. García del Dujo, 2011).

In fact, and without relinquishing the pursuit of a scientific rationality which crossed several centuries during its construction, the new technological needs require a stronger attachment of theoretical knowledge to applied knowledge, generating *technoscience*. This value added to knowledge becomes manifest not only thanks to its applicability, but also through the innovative and creative potential that is intrinsic to it. As Pérez Romero asserts: «What is at stake now, especially in a social order of globalised economies, is “to know in order to innovate”, that is to say, “to know in order to create new knowledge”, well beyond the mere “know-how”» (2004, 25). In the context of this new status of knowledge inaugurated by the information and communication technologies, the supposedly disinterested pursuit of scientific truth and the formulation of objective and universal laws referring to the factual world are challenged in their logical and ontological priority. In a large measure, it is the hegemony of Enlightenment which had converted Science and Reason into the pillars sustaining the modern world and the notion of Progress inherent to it that is now contested on the same footing as the metanarratives associated with it. The very density of the ontological world still to be known seems to melt into air because of the emergence of new technologies that allow to create a new virtual reality as an effect of the invention and simulation based on the existing reality. For a postmodern science must offer a greater capability of multiple locations and, consequently, a larger possibility to produce contextualised models.

Now, as far as Social Sciences are concerned, as well as in the more specific and conflictive case of Education Sciences, many researchers focus exclusively on a purely instrumental rationality that be capable of modelling effective instructional practices. On the opposite side, the growing discontent reinforces the stance of those who understand that the educational practice may be conceived as a form of aesthetic creation, fundamentally determined by a purposeful design, and that a modelling effort inspired by instrumental rationality mutilates the essence of education (Romero Pérez, 2004, 36).

In order to avoid the partiality of these both reductionist positions, we argue that the Education Sciences should recognise and combine distinct forms of rationality, given that the cultural semantics of school performance usually demands a straightforward reference to a strongly instrumental rationality, even though this still supports an epistemic rationality. For it must be acknowledged that, when reported to human systems, the efficiency and efficacy criteria do not allow linear definitions, as may be the case for non-human systems. Indeed if, for some authors, the praxeological objectives are associated in a more intrinsic way to the so-called Pedagogy, whereas the term «Education Sciences» is reserved to represent

in a broader and plural manner the knowledge on the educational phenomena in all their nuances, ranging from the teleological dimension to the operational and practical dimensions, it remains essential to consider that the epistemic legitimacy of Education Sciences can never exclude the practical dimension of a rational operability properly conjoined with the various readings and approaches that respond to the educational phenomena.

The aforementioned points to the possibility of a, so to speak, triangular approach, able to articulate the referred dimensions. That is what we will try to render explicit as the conclusive epilogue of our effort to multidimensional and antinomial epistemology.

5. CONCLUSION

The above discussed epistemic and normative requirements for a theory of education, that one can also envisage as a metatheory of education, has lead us to propose a triangular metatheory to account for the irreducible complexity of education. It presents a three-dimensional field where Education Sciences comprise, firstly, a hermeneutic and speculative dimension, cultivated by philosophy and oriented towards the setting of values and goals for the action², secondly, a descriptive and explanatory dimension, common to other Social Sciences, and thirdly an operational and technological dimension which surpasses the mere technical rationality confined to the selection of means and operationalization of goals, and therefore is in search of an intersubjective agreement that builds a consensus on the deontological normativity that regulates the activity of the professional educator, in its role of free agent and as a resource for action and change.

In the conceptual map of Education Sciences one may consider the production of specific knowledge regarding educational phenomena, whose social legitimation requires necessarily the establishment of a firm correlation between the epistemic rationality and the technological or practical rationality. So when one wonders about the nature of the disciplinary construction of a theory of education, understood in its broadest sense, one comes to realise that education is not reducible to a merely descriptive or explanatory level, from which stems a blind instrumental rationality, restricted to a logic of means-ends relationships. Hence it follows that theorising education demands a new rational location where the technological rationality becomes intimately interwoven with an instrumental as well as an epistemic and teleological rationality. In so doing, the process of choosing and assigning means to ends integrates an assessment of the valuable character of the instrumental and teleological components of action, considering not only to criteria of efficiency and usefulness but also the social and ethical dimension.

2. As several meta-analysis recently have shown (CHAMBLISS, 2009; WORTHAM, 2011; HAYDEN, 2012).

As stated by Romero Pérez (2004, 68),

Education Sciences are not exact sciences, but this does not entail the possibility of rationalising educational processes from a technological knowledge on education. To proceed in a technological way is to act rationally and professionally, and this includes coordinating basically two temporal logics: the logic of stability, characteristic of the man of science, and the logic of contingency that pertains to the man of action and technological applications.

If we think the historical process of Education Sciences from this epistemic framework, we must emphasise the fact that Education Sciences have proposed a reading of social life that contributed to the revision of many archaic conceptions of society and to the triggering of new societal demands concerning the conditions of access and success to education that benefitted the young generations. Despite a widespread feeling of a general educational crisis, modern education has surely changed its praxis by virtue of the new pedagogical knowledge. Likewise, society as a dynamic whole has also changed stimulated by the new educational ideology with clearly reformist aspirations.

The New Education movement created the right conditions for experimenting and implementing a new ideological grammar to renovate the school system that succeeded in launching transnationalisation of educational thanks to the establishment of international institutions designing the core structure of curriculum development. Owing to its strong connection with Psychology, and particularly with Developmental Psychology, the Modern School has become the vehicle of a new idea of scientifically-based teaching practice, whose theoretical foundation lied on an ideology of progress and individual autonomy that constituted the prolongation of what Enlightenment had conceived as the rebirth of *Paideia*. And if in this pedagogical revolution oriented towards paidocentrism new progressive social ideas were forged, it was the success of its internationalisation proceeding from a new understanding of the meaning and goals of education that, in the last instance, confirmed and validated the process of universalization of representations, norms and models of the schooling institution, even long before the movement of economic globalisation and the media culture that new ICT have expanded and reinforced.

One must denounce the epistemological fallacies of comparative studies, in keeping with the argument presented by Thomas Popkewitz and M. Pereyra (1994). There is no doubt that comparative studies have contributed to build a new international educational semantics which gave rise and legitimacy to much interest for such type of research. And this standardisation of educational policies was able to leverage development ideologies that are consonant with technocratic figurations of modernity and progress. Now, such figurations widely legitimised in the 1960's by the human capital theory of Theodore Schultz, put at the foreground the belief that educational issues have a determining impact on economic expansion. The following decades did not share the same optimistic outlook as one could gradually witness the growth of a transnational market of educational goods, absolutely

detached from the utopian vision of education as means of building social fairness and personal actualisation for all. Along with these abrupt social changes imposed by a global market based on financial capital operations, one has observed the emergence of new set of critical and somewhat chaotic theorizations in Education Sciences, while at the same time institutional managers plead vigorously for a more rigorous evaluation of the effectiveness of school systems and of the educational practices adopted by teachers. Thus began the age of compulsory and continuous external evaluation procedures. In this context of the total hegemony of a single thought, one must ask: what will Education Sciences become with its historical assignment for scientific research and theoretical reflexivity?

More than ever, given the present and future new challenges and threats, educational metadiscourse must engage in a foundational and critical enterprise. More specifically, it must reconcile its technical rationality with a visionary teleological rationality. However, it is to be expected a stronger outer demand for Education Sciences to prove their social efficacy and productivity. Equally expectable, the allocation of financial resources for research will be ideologically filtered in the sense that there is in practice a sharp asymmetry between the teleological and the technical values favouring the latter and converting them into the formal and normative criteria to assess all educational endeavours and to measure the magnitude of their deviations.

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