The recent development of biosemiotics has revealed the achievement of knowledge and the development of science to be the results of the semiosis of all life forms, including those commonly regarded as cultural constructs. Education is thus a semiotic structure to which evolution itself has adapted, while learning is the semiotic phenomenon that determines the renewal of life itself. Historically, it was a semiotic paradigm that determined the emergence of institutions such as universities and that underpinned the development of liberal education. The present article considers the history of education in terms of sign emergence and evolution, regarding education as currently being conceived and practised as a stage in the general evolutionary action of signs. This approach differs from the prevailing modern approaches to education, which are mostly applied psychology and sociology.

THE COOPERATION OF SEMIOSIS AND EDUCATION

The argument is in three stages. The first section gives a brief account of recent research in the field of semiotics of education and articulates its relationship with ongoing semiotic research. I argue that semiotics is the discipline that is starting to shape the contemporary mentality, being the point at which cultural evolution has arrived, and that the semiotic apparatus permits a holistic view of the history of educational philosophy. The second section offers a brief account of the historical emergence of the need for educational theory and the emergence of a semiotic consciousness, and of the interrelated evolution of these two theoretical and practical endeavours, where the latter is underpinning the former. Once these have been presented, education’s rediscovery of semiotics can be regarded as an evolutionary result of sign action. I argue that the evolution of the structures of signification that education comprised led inevitably to a semiotic doctrine of education. Finally, it is argued that semiotics is the key to the reimplementation of liberal education in educational institutions. Liberal education and semiotic mindedness have long been productive partners.

In 2009, Frederik Stjernfelt remarked that: ‘it is only in the ongoing interaction with other disciplines that semiotics finds its place as the
non-skepticist mediator between formal and material, humanist and scientific, strands of academia’ (Stjernfelt in Bundgaard and Stjernfelt, 2009, p. 233). This being so might tempt one to consider that it is just a convenience that semiotics has recently become an interesting approach for what used principally to be the business of psychology and sociology. The compatibility between semiotics and education is deeper than this, however. About a century ago semiotics was rediscovered, in the last half century it gained serious popularity within academia, and in the last decade it has begun to be developed within philosophy of education. There is as well a body of work, of which this article intends to be a part, which offers an epistemological view on the semiotics of education, such as the work of Andrew Stables (2005, 2006, 2008, 2012), Eetu Pikkarainen (2011), Sebastien Pesce (2011, and in Semetsky, 2010) and Winfried Nöth (2012, and in Semetsky, 2010), as well as semiotic approaches to particular educational matters, such as language learning, in Danesi (2000) and Nöth (2012), knowledge acquisition in Semetsky (2005), schematicism, iconicity and notation in Pigrum (2010, 2011a, 2011b), ethics in Semetsky (in Semetsky, 2010), rhetoric of education in Torill Strand (2013a, 2013b), the teaching and learning of mathematics in Bakker and Hoffman (2005) and others. In his Foreword to the 2010 edition Semiotics, Education, Experience, edited by Inna Semetsky, Marcel Danesi coined the term edusemiotics. It is curious, though, that there was such a long period between semiotics being rediscovered, in the late 19th century, and its implementation in education studies, in the early 21st century. It is not a surprise that there are many interesting particular topics with which this community of researchers is concerned, such as learning, adaptation, interpretation, the classroom, schematicism, iconicity, diagrammatic reasoning, the student-teacher relation, the phenomenology of the classroom and so on. Owing to this already existing work there is now the possibility of generally explaining educational philosophy in terms of meaning phenomena, in semiotic terms.

EDUCATION AS A RESULT OF SIGN EVOLUTION

The present article offers an approach to the emergence, evolution and activity of educational institutions grounded in biosemiotics. An institution is a particularly crystallised frame within a larger web of signs, the result of the evolution of qualities shared by various semiotic agents participating in learning phenomena; it is a particular Lebenswelt, if one follows John Deely’s notion of Lebenswelt, stemming from the biosemiotic concept of Umwelt:

Two people have the same ideas, but these ideas as psychological realities are but the foundations for a relation to an object; and while each person may have his or her own idea, that which the idea is considered is the same between two people, they may well feel differently about that object. The Innenwelt gives rise to and sustains an Umwelt, and each Umwelt in turn gives rise to an indefinite number
of possibilities for both communication and ‘misunderstanding’. I put this last word in quotation marks, because it introduces us to the distinguishing feature of the human Umwelt, to what further makes of a simple Umwelt a linguistic Lebenswelt: the human animal is the only animal which becomes aware of the difference between objects and things in terms of the difference between what is related to the knowing organism and what exists apart from or regardless of that relation (Deely, 2001, p. 8).

The emergence of a body of literature that proposes semiotics as an educational philosophy is unsurprising. Initially, the development of semiotics constituted the rationale of the implementation of a liberal educational philosophy. The rediscovery of semiotics that is occurring in the present age brings along a new wave of philosophy of education.

Both semiotics and education are disciplines that have ancient origins. The interests that human beings have shown both towards signs and towards passing on what has been acquired are probably as old as humanity itself, or at least as old as humanity’s conscious interest in knowledge in general. The conceptualisation of something standing for something else (what we now call sign) probably started in practices such as astrology or divination (Deely, 2001). Both of these inquiries, the study of signs and the art of teaching and learning were developed in classical Greek philosophy, each usually independently one of the other, but they met in a moment that was crucial for the development of modern philosophy. In Ancient Greece, especially with Socrates, the consciousness of teaching that which is valuable per se was entrenched. With Aristotle and Cicero the tradition of the seven liberal arts begins and it is carried on later by authors such as Tertullian and Quintilian. The liberal arts have been broadly understood as those arts that were valuable per se, in contrast to utilitarian arts (crafts) and the seven fine arts (architecture, instrumental music, sculpture, painting, literature, drama, and dance), which were valuable throughout their production. The main argument for teaching the arts which are valuable per se, immanent and intransitive that is, is that these generally prepare the intellect of a being for knowledge. Whatevery the object to be known is, the liberal arts, or rather the principle of the liberal arts, prepares the mind to grasp it. To put it simply, the liberal arts are universal.

In early-Christian Europe, if liberal education were to continue, the issue regarding the learning of non-scriptural teaching had to be clarified. Cassiodorus set out his work on the liberal curriculum precisely with the observation of this tension, between the realisations of pre-Christian philosophy and Christian teachings:

When I realized that there was such a zealous and eager pursuit of secular learning, by which the majority of mankind hopes to obtain knowledge of this world, I was deeply grieved, I admit, that Holy Scripture should so lack public teachers, whereas secular authors certainly flourish in widespread teaching. Together with blessed Pope Agapetus of Rome, I made efforts to collect money so that it should
rather be the Christian schools in the city of Rome that could employ learned teachers—the money having been collected—from whom the faithful might gain eternal salvation for their souls and the adornment of sober and pure eloquence for their speech. They say that such a system existed for a long time at Alexandria and that the Hebrews are now using it enthusiastically in Nisibis, a city of Syria (Cassiodorus, 2004, I.1).

Around the middle of the first millennium there was a certain cultural competition between Byzantium and Rome (see Mark’s Introduction to Cassiodorus: Vessey, 2004, pp. 26–27), which fuelled a race for secular knowledge on both sides. Among the Patristic authors a general interest towards signs is evident. One of the most influential thinkers of the early Medieval Age, St Augustine, set the agenda not only for the education of his times, but for the eventual emergence of the institution of University. In *De Doctrina Christiana*, Augustine argues that that which is not directly, immediately Scriptural is not necessarily profane, but can be regarded as secular. The secular is valuable according to its use. Therefore, the secular teachings are good for the Christian to learn, in service of the Christian mission of transfiguring the world.

In this work, which is widely considered to set a semiotic consciousness (Deely, 2001 and Marmo, 2010), in the late 4th century, St Augustine states at the outset the reason for developing a theory of signs: ‘all teaching is teaching of either things or signs, but things are learnt through signs’ (Augustine, 2008, I.4). In this same work, it is widely admitted, St Augustine gave the definition for the concept of *sign* that set the path for the further development of medieval semiotics, which in turn dominated medieval philosophy. From the start, he stated that the interest in the study of signs is not their *being*, but their *signification*. This is a first insight towards an ontology of relations that semiotics will later prove to be:

Now that I am discussing signs, I must say, conversely, that attention should not be paid to the fact that they exist, but rather to the fact that they are signs, or, in other words, that they signify. For a sign is a thing which of itself makes some other thing come into mind, besides the impression that it presents to the senses. So when we see a footprint we think that the animal whose footprint it is has passed by; when we see smoke we realize that there is fire beneath it; when we hear a voice of an animate being we observe its feeling; and when the trumpet sounds soldiers know they must advance or retreat or do whatever else the state of the battle demands (Augustine, 2008, II.1).

As already mentioned, it is agreed among semioticians today that *De Doctrina Christiana* set the theoretical premises for the development of the *Doctrine of Signs*:

Medieval semiotics has developed along the path traced by Augustine in *De Doctrina Christiana* (I, 2, 1) and has conceived the sign as a res
or a signifying quid, whose apprehension allows one to know something else (significatum) (Marmo, 1987).

Deely reinforces this:

With this definition, at a stroke, Augustine proposes the sign as superior to the division of being into natural and cultural: any material structure, whether from nature or art, which, on being perceived, conveys thought to something besides itself functions as a sign (Deely, 2001, p. 221).

Therefore, semiotics and liberal education fundamentally have the same root, the development of semiotics having the rationale of serving liberal education. *De Doctrina Christiana* is the source of the medieval curriculum, the curriculum of the liberal arts, which, in Western Europe, constituted the very reason for the emergence of the institution of University. Education and semiotics not only have the same root, therefore, but their historical evolution is interdependent. Deely identifies the main figures behind this development:

The tradition of liberal arts education in the West is rooted in certain conceptions (and misconceptions) of Augustine, Boethius, Cassiodorus, and Isidore of Seville; but it was Cassiodorus (c. AD 480–573), a contemporary of and noble Roman like Boethius, who first pulled the sources together so as to initiate this great tradition (2001, p. 183).

Scholastic philosophy was a genuinely semiotic paradigm. Deely considers scholasticism a second step in the development of semiotics, following Augustine:

Semiotic consciousness, thus, first arose in the time of Augustine, but its principal development as a theoretical theme did not occur until much later, beginning with Aquinas and Roger Bacon in the 13th century and continuing thereafter right down to the time of Galileo and Descartes, where it found its theoretical vindication in the work of John Poinsot. This main period of theoretical development occurred in two phases, both of which have been identified only in the most recent times and both of which have only begun to be explored in depth (Deely, 2000, p. 40).

In the 13th century the sign constituted the main philosophical interest and debates on signs were common among, *inter alia*, Roger Bacon, Bonaventura of Bagnoregio, Thomas of Erfurt, Henry of Ghent and other scholastics (Marmo, 2010).

In late scholasticism the semiotic paradigm was still fertile. Joao Poinsot (1589–1644) explains about the academic Lebenswelt of the Iberian peninsula of his time that the debates on sign and signification were ‘a matter
of daily dispute in the schools’ (Joao Poinset 1632: 680a38–39 in Deely 1982, p. 50; Poinset, 1985). These semiotic disputes were kept alive in the Iberian Peninsula by scholastics such as Petrus Fonsecus, Francisco Suárez and Ignatius of Loyola. Contemporary semioticians, such as Deely, regard Poinset as one of the first to develop a fully suprasubjective ontology, a doctrine of signs peculiarly familiar with Peirce’s.

One of the earliest educational texts was Cassiodorus’s previously mentioned 6th-century work, Institutiones divinarum et saecularium litterarum, in which the most frequent Patristic reference is De Doctrina Christiana. If in Institutiones Cassiodorus does not explicitly offer any insights on signs it does not mean that the work lacks a semiotic consciousness, but rather that it is implicit. Cassiodorus was focused on explaining what subjects to study and where the pedagogical material was to be found; he did not focus on explaining methods of teaching and learning. These methods, which constitute the semiotic background of liberal education, were already developed, mostly by St Augustine, who is Cassiodorus’ main reference. Cassiodorus himself makes it explicit that he is not interested in making his own contribution to the matter of education, but rather that he wants to pass on the teachings of the Patristics on education, which, as mentioned before, especially in the Latin world, were profoundly semiotic:

I commend in them not my own teaching, but the words of earlier writers that we justly praise and gloriously herald to later generations (Cassiodorus, 2004, I.1).

In an introduction to Cassiodorus’ Institutiones, Mark Vessey notes that Cassiodorus inherited the division of knowledge into divine and secular, as well as the justification for the need of both, mostly from two Latin Patristic authors, Jerome and Augustine:

His masters in this domain were the two greatest Latin fathers of the later fourth and early fifth centuries, Jerome and Augustine. Between them they supplied him with a rationale for distinguishing the categories of ‘divine’ and ‘secular’ knowledge and for combining their respective textual resources in a single pedagogy (Vessey, 2004, p. 28).

Thus, it is within a semiotic mind frame that liberal education sets off and it is in the Lebenswelt of Western scholasticism that the institution of University emerges. Out of early scholasticism were developed the first universities: Bologna (1088), Paris (c. 1150), Oxford (1167), Palencia (1208), Cambridge (1209). The university appears as the institutionalised embodiment of liberal education, the instantiation of the rationale of the Doctrine of Signs. Note that in parts of the world where a semiotic consciousness was not entrenched the university did not emerge, such as in Eastern Europe, or did emerge but did not endure, such as in the Islamic world. The Byzantine world, however, produced various impressive thinkers in between early Patristics and modernity, some of whose works are
highly relevant for semiotics. St John of Damascus, St Theodore the Studite and Patriarch Nikephoros are the three main authors who, by arguing for the veneration of Icons in the Christian Church, developed a concept of Icon peculiarly similar to Peirce’s.

THE ROLE OF THE ICON IN LEARNING

The concept of Icon also plays a crucial role in Peirce’s semiotics, a fact that we have only recently begun understanding. Actually, it is with a certain switch of attention from conventional signs to iconic signs that semiotics makes a step towards understanding Peirce’s philosophy in its own terms, as a realist semiotics and not as a nominalist or linguistic semiotics. Both conventional and iconic signs play a crucial role in the biological realm, the signifying structures of the Universe, but, from this point of view, it is strictly due to iconic signs that other types of signification become possible. Frederik Stjernfelt identifies a certain ‘iconic turn’ within semiotics, taking place in the 1990s, marked by Umberto Eco’s new take on Peirce, in *Kant and the Platypus*:

One of the results of the iconic or phenomenological turn of semiotics during the recent decades is that its close affiliation with the Linguistic Turn is weakening. Thus, linguistics ceases to be the model science of semiotics, even if language, as an object, of course, remains a core issue for semiotics. Language appears as the most central of many cognitive and communicative tools of man, and semiotics—as indicated by the predicate ‘cognitive’ in cognitive semiotics—must base itself on the study [of] all such tools. This implies the empirical connection of semiotics to all aspects of cognitive science (from sociology over psychology to neuroscience)—and the conceptual connection of semiotics to epistemology, philosophy of science, and ontology (Stjernfelt in Bundgaard and Stjernfelt, p. 232).

Therefore, this iconic term has a crucial role in the conceptualisation of semiotics as a discipline, an academic *Lebenswelt*, in itself, distinct from, for instance, linguistics. According to Peirce the Icon is simply the sign which signifies due to similarity:

An *Icon* is a sign which refers to the Object that it denotes merely by virtue of characters of its own, and which it possesses, just the same, whether any such Object actually exists or not. It is true that unless there really is such an Object, the Icon does not act as a sign; but this has nothing to do with its character as a sign. Anything whatever, be it quality, existent individual, or law, is an Icon of anything, in so far as it is like that thing and used as a sign of it (CP 2.247).

The reason for which the Icon is a centrepiece for Peirce’s semiotics is that signification occurs on a continuum of similarity. No matter how high
the degree of convention in a phenomenon of signification, a basic simi-
lar similarity made the signification possible (see Stjernfelt, 2007). We encounter 
this idea in the aforementioned example of defenders of Icon veneration. 
Charles Lock synthesised the arguments of these mentioned authors by 
paraphrasing St John of Damascus in the following way:

Either accept these [icons], or get rid of those [Gospels] . . . (Lock, 
1997, p. 10).

This idea, that signs that have an obvious degree of conventionality must 
have a non-conventional ground in order to be used is not only a central 
assumption for Peircean semiotics, but also a crucial point for learning, 
teaching and education in general. Peirce makes this explicit:

. . . a great distinguishing property of the icon is that by the direct 
observation of it other truths concerning its object can be discovered 
than those which suffice to determine its construction. Thus, by means 
of two photographs a map can be drawn, etc. Given a conventional or 
other general sign of an object, to deduce any other truth than that 
which it explicitly signifies, it is necessary, in all cases, to replace that 

sign by an icon. This capacity of revealing unexpected truth is pre-
cisely that wherein the utility of algebraical formulae consists, so that 
the iconic character is the prevailing one (CP, 2.279).

The important fact here is that, according to Peirce, something becomes 
apprehensible for the human intellect because of its Iconic character. Ana-
lysing Peirce’s semiotics, Stjernfelt argues that Iconicity is mandatory in 
any phenomenon of signification, at least for anything comprehensible to 
be signified and arrives at the observation that can constitute the corner-
stone of a semiotic philosophy of education:

This leads us to what is probably the most decisive feature in icons at 
all: the fact that they are the only signs through the contemplation of 
which it is possible to learn more [. . .] (Stjernfelt, 2007, p. 78).

Returning to these Eastern medieval theologians, one can observe that 
they were not interested in developing philosophy, intellectual achieve-
ments not having an intrinsic purpose for them, but that their focus was 
simply to achieve a life of prayer (see Lossky, 1944). Eastern theologians 
produced texts in response to controversies as means of clarification only 
at moments when a controversy would occur. A semiotic consciousness 
was not entrenched here at an academic level, even though a semiotic 
thinking can be observed occasionally, because such an academic 
endeavour was not seen as a purpose to follow, as any other focus besides 
prayer could be a distraction from prayer, the important focus for such 
authors.
A SEMIOTIC ACCOUNT OF THE EMERGENCE AND DEVELOPMENT OF THE UNIVERSITY

Since the 11th century, in Western Europe, St Augustine’s definition of sign from De Doctrina Christiana ‘already since Berengar of Tours becomes the mandatory point of reference for any discussion on the sacraments’ (Marmo, 2010, p. 11). It is this same Lebenswelt, the Lebenswelt that gave rise to the university, that also constitutes the source for Peirce’s (mature) semiotics, as Peirce himself declared: ‘I am myself a scholastic realist of a somewhat extreme stripe’ (CP 5.470). Peirce acknowledged St Augustine and the medieval scholastics as the pillars of his own doctrine:

Before I came to man’s estate, being greatly impressed with Kant’s Critic of the Pure Reason, my father, who was an eminent mathematician, pointed out to me lacunae in Kant’s reasoning which I should probably not otherwise have discovered. From Kant, I was led to an admiring study of Locke, Berkeley, and Hume and to that of Aristotle’s Organon, Metaphysics, and psychological treatises, and somewhat later derived the greatest advantage from a deeply pondering perusal of some of the works of medieval thinkers, St. Augustine, Abelard, and John of Salisbury, with related fragments from St. Thomas Aquinas, most especially from John of Duns, the Scot [. . .] and from William of Ockham (CP 1.560).

In summary, St Augustine set the premises for both semiotics and liberal education in De Doctrina Christiana. This work became the main source of reference on matters of education and sets in train a tradition developed by Boethius, Cassiodorus and St Isidore of Seville (5th, 6th and 7th centuries respectively), the authors who set the principles of liberal education in the Medieval Age. In scholasticism, semiotics, the Doctrine of signs, was the main interest of philosophy. In the same Lebenswelt, that of medieval scholasticism, the institution of university emerges. This Lebenswelt constitutes the seeds of Peirce’s semiotics.

After scholasticism, in Western Europe, the focus of academia switched from the sign, the relational being, to mental entities (ideas, concepts). The contemporary semiotician cannot miss this anti-semiotic turn that philosophy took with modernity. Deely notices that rationalism and empiricism, from a semiotic point of view, are fundamentally in agreement that mind-dependent being entirely constitutes the domain of human life:

For even though Locke chastised Descartes for separating ideas of reason from sense experience, yet more fundamentally he agreed with Descartes that ideas, mental representations formed by the human mind in its interiority (albeit of sense first rather than of reason), wholly constitute the direct and immediate object of human experience (Deely, 2009, p. vi).

The university, and education in general, needing freedom for the development of scientific method, became secularised and in time detached from
monasteries and, following the Enlightenment, it became the only institution with the power to legitimise knowledge. Lyotard used the term *modern* precisely ‘to designate any science that legitimates itself with reference to a metadiscourse of this kind making an explicit appeal to some grand narrative, such as the dialectics of Spirit, the hermeneutics of meaning, the emancipation of the rational or working subject, or the creation of wealth’ (Lyotard, 1979, p. xxiii): the axiomatic ground of science, to put it briefly. The scientific method made the industrial revolution possible. The scientific method, a result of centuries of inquiries with key moments such as Aristotle, Cassiodorus, Duns Scotus and William of Ockham, brought an impressive economic increase for those Western states using, beginning with its proper implementation at the dawn of modernity. Thus, as Lyotard observes, modernity is an age dominated by scientific (meta-) discourses. Such a metadiscourse has been the only means of legitimation. The institution that led intellectual efforts to modern science and that managed science was, of course, the university. Thus, the university becomes the only institution that can legitimate a discourse and, as a consequence, becomes political. The modern age was the age of science. If some other socio-cultural life-form wanted to keep the pace with the scientific revolution happening in Western Europe, at least for the purpose of maintaining its freedom it had to import the scientific research institutions of the Western world. It is with Enlightenment that the University is imported from the Western world all over the globe. This can be seen, though, as a result of an imperialistic triumph of the Occident: at this point the rest of the world just had to adapt to the Occidental Lebenswelt.

The semiotic consciousness of the scholastics endured in Western Europe until the first modern philosophers switched the attention from suprasubjectivity to the realm of the mind. From Descartes, the focus on signs becomes replaced with a focus on ideas or concepts. While the university lived on, in late modernity, it experienced a deviation from liberal education. This can be seen as a consequence of the university’s impact on life on a political level. In late modernity, when a political discourse no longer manifested the power it did in the Medieval Age, a metadiscourse stemming from research is received with scepticism, as it is, by tradition, automatically associated with a means to achieving political capital. It is in this moment that another institution gained the power to legitimate: the corporation. Thus, the university had to borrow the semiosic structure of the corporation. In a critique of corporatism, Naomi Klein, remarks:

I had been doing some research on university campuses and had begun to notice that many of the students I was meeting were preoccupied with the inroads private corporations were making into their public schools. They were angry that ads were creeping into cafeterias, common rooms, even washrooms; that their schools were diving into exclusive distribution deals with soft-drink companies and computer manufacturers, and that academic studies were starting to look more and more like market research (Klein, 2000, p. xxxviii).
University education became more and more focused on teaching skills and crafts; that is, generally means by which the students are prepared for the job market. This is a narrowly utilitarian, rather than a liberal, education. This turn in education can be understood as a result of the turn from a semiotic to a non-semiotic philosophy. If liberal education endured for a while in the non-semiotic modernism, it was because of a not particularly visionary educational conservatism. This conservatism is easily justified: capital was gained through the work of universities. The university was a vital organ and its research a vital function for the wellbeing of the state. Nevertheless, once the semiotic consciousness faded away from the educational *Lebenswelt*, philosophy of education lost the rationale of its liberal principle and the university had to change its way of being. However, insofar as semiotics underpinned liberal education, a return to liberal education might be promoted through a re-emergence of semiotics. This is possible now, given education’s recent rediscovery of semiotics. Most important is that the intimate compatibility between philosophy of education and semiotics was rediscovered, and now with new insights that were not yet possible in medieval semiotics.

**LEARNING AS DISCOVERY**

Educational studies’ orientation towards semiotics is not a mere coincidence. The contemporary semiotician can now observe a structural coherency of this evolution of institutionalised liberal education, within the much longer, broader and general evolution of life. Looking at the particular phenomenon of signification which we came to recognise as a Subject-Predicate structure, signs that we usually refer to as propositions, or, in Peircean terminology ‘Dicisigns’, Frederik Sjernfelt observes that natural selection adapted to Dicisigns, as well as to signs in general, not the other way around. The basic Subject-Predicate structure is necessary for efficiently conveying information. Evolution has increasingly adapted to the structures of signification (cf. Stjernfelt, 2011). This can be said about signs in general. Evolution had to adapt to signification. Kalevi Kull (quoted in Bundgaard and Stjernfelt, 2009) explains that the *mind* of the modernists or the νους of the ancients is not the plural semiosic mind:

A study of the nature of semiosis that includes its inevitable attributes (recognition, memory, feed-forward, code, emergence of absence, etc.) leads to a general model of the life process, a model that explains the emergence of complementarity. A most compact conclusion from this understanding states that *semiosis multiplies reality*, that mind means plurality. Or, synonymously, that life is the local plurality. This means that this ‘discovery’ is also the answer to the question about the nature of life. Life is the phenomenon of the occurrence of plurality in the world. What thus turns to be locally plural is the reality itself. And this IS life, life itself (Kull, 2007) (Bundgaard and Stjernfelt, 2009, p. 116).
This biosemiotic framework proves to be very relevant for education studies, as it is implicit with the realist semiotics discovered once with the iconic turn. In this framework learning will be investigated as a discovery of similarities constituting in a relation of signification. This concept of learning is wide enough to contain most of the important issues of education, such as creativity, evaluation, and an epistemology of education:

The fact that it has never before been asserted that this orange on the table before me is similar in shape to the moon (given a certain granularity of similarity classes), might cause sensible souls to see me as a genius for creating metaphors, but, modestly, it seems strange that this similarity should be something created by me. I merely discover (no great effort) this similarity by applying a certain tertium comparationis (a circle, give or take a certain rate of deformation). In rare cases, of course, it may take great pains to establish a new complicated tertium comparationis to see a similarity (Newton discovering the similarity between the movement of the apple and of the heavenly bodies, Eliot discovering the similarity between cruelty and the growth of April flowers) (Stjernfelt, 2007, p. 57).

Biosemiotics thus has the potential to play a fundamental role in philosophy of education. For instance, a quite common and narrow interpretation of Darwinism, which constituted a threat in philosophy of education, determined educators to simply avoid Darwinism. Gough and Stables remark that, because of its non-dualist doctrine, a semiotic account of evolution does not present any more the danger of justifying racism, sexism or other discriminatory doctrines in philosophy of education:

On a strict substance dualist account, Darwinism itself can be understood as construing ‘reality’ as brute mechanical physicality, devoid of mind or intention. By overcoming this dualism, a fully semiotic account effectively removes this objection to Darwinism. Darwinism on this account does not, therefore, endorse racism, sexism, imperialism or the triumph of might over right, forbid altruism or collaboration, or explain human aspirations in purely genetic or biological terms (Gough and Stables, 2012, p. 371).

The model of evolution that is brought about by biosemiotics is not arborescent, which means that evolution is not simply a process leading from simple and dull to complex and knowing. Species are not better or worse, under-evolved or evolved, species are simply different, as each species (if not each individual) is engaged in a different Umwelt. This is a way of expressing the fact that the lives of different species are different. Different signification means different being.

The point which Gough and Stables make is that interpretation is a matter of adaptation. Such is the case of institutions and, generally, social life—these are the structures of meaning which biological and socio-cultural evolution (which are not separate) have arrived at. They are not necessarily
better or worse than previous or impending structures of meaning, but are the instant embodiments of a semiosis—an Interpretant at a moment in time-space. Semiotics, in a Peircean tradition, easily accounts for the continuity of nature and culture, body and mind, etc.

THE RESPONSIBILITY OF SEMIOTICS IN EDUCATION

Turning specifically to learning and teaching, approaching education in semiotic terms does not explain the failure of the student as a cognitive handicap (as psychology tended to) or a social handicap, a lack of capital, a lack of social power, the belonging to certain social strata (as sociology tended to). Semiotics does not acknowledge such a thing as the failure of the learner. What is taught by the teacher never coincides perfectly with what is learned by the student. On a semiotic account, learning is interpreting. An immediate conclusion is that genuine learning, whatever it might be, is possible only in a free environment. Learning something new consists in a discovery of similarities (Stjernfelt, 2007), and, thus, in placing a Subject in a newly discovered relation of signification with a Predicate. This proposition, that can set the direction of research in semiotics of education, can only be validated by accepting that the learner does not only learn to handle a language (a code), but she is learning the general doctrine of signs (logic), which occurs wherever there is life (Kull, 2005). Thus, teachers should offer the learner the optimal experiences for learning so that the learner develops her logical (semiotic) capacities for handling real-world events. The learning process of logic is immanent, occurring naturally, as evolution has perfected it over time, being any human person’s capability of predicing (discovering similarities). What is not immanent and should be learned is that which is valued socio-culturally. Two types of performances are therefore expected from the learner: (1) to discover the similarities that led to her understanding the web of signs evolving as society and (2) discovering similarities which society has not yet discovered, thus contributing to the continuous evolutionary progress. Assuming these two performances from the students, there is no more strict distinction between teaching and learning. Teaching and learning in the consecrated sense are bound together as a phenomenon of interpretation, which can be termed learning, in a semiotic sense. If learning is free interpretation under the form of discovery then the teacher does not know what the student is about to discover. Learning, in this semiotic sense, is a continuous abduction-induction-deduction phenomenon and it is in all cases unique; the chance of an identical repetition of the same learning phenomenon is impossible, since there are no chances of repeating an identical situation of sign relations. Both the student and the teacher are involved in this phenomenon by learning. Thus, the argument for learning that which is intrinsically valuable, the principle of liberal education, flows from a semiotic perspective. A craft cannot be taught at all, the skills of hammering, knitting or riding a bike are learned only in an accident of signification, due to an experience of the learner. In St Augustine’s De Doctrina Christiana
this idea, that teaching and learning liberal arts are one and the same, is stated from the beginning:

There are two things on which all interpretation of scripture depends: the process of discovering what we need to learn, and the process of presenting what we have learnt. I shall discuss the process of discovery first, and then that of presentation. This is a great and arduous burden, one difficult to sustain and also, I fear, a rash one to undertake; [. . .] For all the things which do not give out when given away are not properly possessed when they are possessed but not given away. God says, ‘the man who has will be given more’ [Matt. 13: 12]. He will give to those who have: this means that for those who make generous use of what they have received he will supplement and increase what he has given. One person had five loaves, and another had seven before the loaves began to be distributed to the hungry, but once the distribution had begun, they managed to fill baskets and hampers even after satisfying so many thousands of people [Matt. 14: 17–21; 15:34–8]. So just like the bread, which increased as it was broken, the material which God has already supplied to me for starting this work will be multiplied, through his own provision, when discussion of it begins. So in this act of service I will not only experience no shortage of material, but in fact enjoy an astonishing abundance of it (Augustine, 2008, I.1–3).

Discovery is also a revelation, because by it not only is something unknown discovered by a knowing subject, but the discovered object can be revealed to others. It is all the same learning process.

In the 1930s Vygotsky noticed what St Augustine noticed in the 4th century: ‘the very essence of human memory is that human beings actively remember with the help of signs’ (Vygotsky, 1978, p. 51). Surprisingly perhaps, even in a non-semiotic paradigm, the role that signs play in memory and learning was acknowledged. Danesi (in Semetsky, 2010) expresses his surprise that despite Vygotsky’s popularity among pedagogues, and the rising interest that semiotics is currently enjoying, in philosophy of education semiotics is still not being given enough attention, particularly in relation to learning. Signs, are phenomena to which evolution adapted so that organisms, among which humans most of all, perfected in recognising them. In this case the human endeavour of education is the Interpretant of a long process of evolution, an institutionalisation of a web of signs.

Stables’ simple observation constitutes the nucleus of a semiotics of education:

If all living is semiotic engagement, then learning is semiotic engagement (Stables, 2006, p. 6).

Peirce himself understood life to be semiotic engagement. He even advanced the hypothesis that the emergence of semiosis can account for the emergence of life. Life is the rationale of semiosis:
In short, the problem of how genuine triadic relationships first arose in the world is a better, because more definite, formulation of the problem of how life first came about; and no explanation has ever been offered except that of pure chance, which we must suspect to be no explanation, owing to the suspicion that pure chance may itself be a vital phenomenon. In that case, life in the physiological sense would be due to life in the metaphysical sense (CP 6.322).

On a historical and cultural timescale we have witnessed the development of educational institutions, with their particular structures of signification, adapted to various particular cultures. This, the contemporary semiotician can state while looking back, is the result of semiosis.

A semiotic imperialism within the humanities must, of course, be avoided. At the same time, as researchers involved in semiotics we have to recognise the dawn of this postmodern semiotic age, a fulfilment of natural evolution, in a sense broader than we can comprehend, which has a rationale that, most profoundly, we can now understand as semiotic. Semiotics in education brings along the principle of liberal education because the notion of learning as discovery is a relation of signification which can only happen in an Umwelt or Lebenswelt characterised by freedom of thought; as St Augustine specified in De Doctrina Christiana, any restriction, even that of an imposed temporal limit, biases the inquiry. When one is discovering one does not know what one will discover; therefore, any agenda that might drive learning institutions, any metadiscourse, is an obstruction to learning. Learning, understood in this semiotic way, is genuine only if it is proceeding for its own sake, for the discovery in itself, without being driven by possible benefits that the discovery might provide. It is no surprise to see such a statement on education and research coming from a contemporary semiotician:

Thus, I tend to think it is a duty for scientists to support free speech: the most liberal exchange of signs compatible with democracy (Stjernfelt in Bundgaard and Stjernfelt, 2009, p. 232).

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