

<https://doi.org/10.23913/ride.v10i19.545>

Artículos Científicos

Los principios lógicos y ontológicos del concepto currículo. Una relación epistemológica

***The Logical and Ontological Principles of the Concept Curriculum. An
Epistemological Relationship***

***Os princípios lógicos e ontológicos do conceito de currículo. Uma relação
epistemológica***

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Resumen

El objetivo central de la presente investigación consistió en analizar la relación epistemológica que se puede establecer entre los principios lógicos y ontológicos del concepto *currículo*. Se partió del supuesto de que dichos principios se encuentran relacionados epistemológicamente en las diferentes construcciones de este término, llevadas a cabo por los principales estudiosos del tema y, a causa de esto, las conceptualizaciones sobre el mismo difieren en significados, sentidos y consecuencias existenciales.

Un segundo supuesto, que deriva del anterior, consistió en estimar que los principios ontológicos se refieren al ser y los lógicos, a las razones en que se apoyan los raciocinios sobre el ser. A ello se debió que, en un primer y segundo momentos, se analizaron los principios lógicos y ontológicos de la ciencia —respectivamente— para, finalmente, intentar relacionarlos entre ellos y con las diferentes concepciones de *currículo* desde sus respectivas circunstancias de modo, tiempo y lugar.

Los hallazgos revelan la existencia de una relación o correspondencia entre los principios lógicos y ontológicos de la ciencia y entre las necesidades existenciales del ser humano, las facultades con las que este pretende resolver los problemas del conocimiento y los supuestos filosóficos en los que, necesariamente, se ubica el concepto aquí en cuestión.

Lo anterior permite concluir —entre otras cosas— que la construcción del término *currículo* es un problema político sin solución definitiva debido a que depende de circunstancias (emociones, pasiones y sentimientos del ser humano; sus necesidades y deseos) de modo, tiempo y lugar que influyen en la voluntad y las intenciones del sujeto cognoscente poniendo en acción sus facultades (su razón y/o sus sentidos) que le posibilitan para actuar y construirse un “currículo” acorde a sus necesidades existenciales, desde determinados supuestos relacionados con las mismas.

Palabras clave: facultades cognoscitivas, necesidades existenciales, principios de la ciencia, problemas del conocimiento, supuestos filosóficos.

Abstract

The main objective of the present investigation was to analyze the epistemological relationship that can be established between the logical and ontological principles of the concept *curriculum*. It was assumed that these principles are related epistemologically in the different constructions of the aforementioned term, carried out by the main scholars of the subject and, because of this, the conceptualizations about it differ in meanings, meanings and existential consequences.

A second assumption, which derives from the previous one, consisted in estimating that the ontological principles refer to the being and the logical ones, to the reasons on which the reasoning about being is based. To this it was due that, in a first and second moments, the logical and ontological principles of science were analyzed —respectively— to finally try to relate them to the different conceptions of *curriculum* from their respective circumstances of mode, time and place.

The findings reveal the existence of a relationship or correspondence between the logical and ontological principles of science and between the existential needs of the human being, the faculties with which it aims to solve the problems of knowledge and the

philosophical assumptions in which, necessarily, the concept denominated with the expression *curriculum*.

It can be concluded —among other things— that the construction of this concept is a political problem without definitive solution because it depends on circumstances (emotions, passions and feelings of the human being, their needs and desires) in a way, time and place that influence the will and intentions of the knowing subject putting into action their faculties (their reason and / or their senses) that enable them to act and build a “curriculum” according to their existential needs, from certain related assumptions with them.

Keywords: cognitive faculties, existential needs, principles of science, knowledge problems, philosophical assumptions.

Resumo

O principal objetivo desta pesquisa foi analisar a relação epistemológica que pode ser estabelecida entre os princípios lógicos e ontológicos do conceito de currículo. Partiu-se do pressuposto de que esses princípios estão epistemologicamente relacionados nas diferentes construções desse termo, realizadas pelos principais estudiosos do assunto e, por isso, as conceituações sobre ele diferem em significados, sentidos e conseqüências existenciais.

Uma segunda suposição, que deriva da anterior, consistiu em estimar que os princípios ontológicos se referem ao ser e os lógicos, às razões pelas quais o raciocínio sobre o ser é sustentado. Isso se deve ao fato de que, em um primeiro e segundo momento, os princípios lógicos e ontológicos da ciência foram analisados - respectivamente - para finalmente tentar relacioná-los entre si e às diferentes concepções do currículo a partir de suas respectivas circunstâncias de modo, tempo e lugar.

Os resultados revelam a existência de uma relação ou correspondência entre os princípios lógicos e ontológicos da ciência e entre as necessidades existenciais do ser humano, as faculdades com as quais ele pretende resolver os problemas do conhecimento e as premissas filosóficas nas quais, necessariamente, o conceito está localizado aqui em questão.

Isso permite concluir - entre outras coisas - que a construção do termo currículo é um problema político sem solução definitiva, pois depende de circunstâncias (emoções, paixões e sentimentos do ser humano; suas necessidades e desejos) de uma maneira, hora e local que eles influenciam a vontade e as intenções do sujeito cognitivo, colocando em prática suas

faculdades (sua razão e / ou seus sentidos) que lhes permitem agir e construir um “currículo” de acordo com suas necessidades existenciais, a partir de certas suposições relacionadas a eles.

Palavras-chave: faculdades cognitivas, necessidades existenciais, princípios da ciência, problemas do conhecimento, suposições filosóficas.

Fecha Recepción: Marzo 2019

Fecha Aceptación: Octubre 2019

Introduction

The research question that motivated the present study was the following: What is the epistemological relationship between the logical and ontological principles of the curriculum concept?

This question was mainly due to the diversity of definitions, characterizations, functions, purposes, elements, etc., which, on the concept mentioned, have been developed throughout the history of curriculum development, in order to establish parameters of exploration, description, explanation, interpretation or understanding of it.

To answer the aforementioned question, it was based on the assumption that the notion of curriculum - like any other idea that every cognitive subject intends to build - starts from certain philosophical assumptions that, in turn, obey the cognitive faculty or faculties that are used. in its elaboration, depending on certain ontological interests that, in the same sense, obey certain needs located in time, space and existential circumstances.

Based on the above assumptions, the category of "logical principles of science" was developed in a first movement. These were divided into rational and / or sensual on the occasion of the cognitive faculties or faculties used in its construction. It should be clarified, from this moment, that these logical principles of knowledge refer to the reasons on which the rationale for being is supported.

In a second movement, the notion of “ontological principles of science” was erected, which were also divided into rational and / or sensual, for the same reasons indicated in the previous paragraph. The difference between the ontological and logical principles of science is that the former refer to being, while the latter - as already mentioned - to the reasons on which the rationale is based on it.

Finally, in a third movement, the epistemological relationship between the logical and ontological principles of the curriculum concept was established in the light of the two previous sections.

In that way it was possible to establish certain parameters of exploration, description, explanation, interpretation or understanding of the different and contradictory definitions, characterizations, functions, purposes, elements, etc., which thinkers have given to the idea of curriculum through time, spaces and existential circumstances in which it has been built.

The logical principles of science

Seeking to understand the logical principles of science, in general, this definition of Aristotle's philosophy (1992) was found: "Theoretical science of the first principles and the first causes" (p. 8).

At first glance, the above definition does not say much, but if the terms used in the predicate of that judgment are analyzed in depth, the assertion will be better understood.

Following Aristotle (1992), the concept expressed in the first principles voice is understood, at first, as the "starting point of the thing" (p. 75); in a second moment, like "that by which a thing can be better done; for example, the principle of a science" (p. 75), and, in a third moment, as "the essential and first part of where a thing comes from" (p. 75).

If these three characteristics of the first principles of science are carefully examined, it can be established that philosophy is a hypothetical knowledge (theoretical science) that provides the elements (first principles) from which the knowledge with which knowledge is best known is born. things because they constitute their own, essential and initial of them.

A principle can be understood as:

The first moment of the being of a thing (...), a point that is considered as first in an extension or thing (...), foundation, origin, fundamental reason on which one proceeds in any matter (...), primitive or first cause of a thing (...), any of the first propositions or truths where the faculties begin to be studied (Real Academia Española [RAE], s. f.).

It is estimated that the explorations, descriptions, explanations, interpretations or understandings about things, events, entities, objects, facts, etc., begin with hypothetical principles that provide fundamental reasons about their foundations, origins, essences, first causes, true roots, etc.

A principle can also be interpreted as follows:

The fundamental cause or universal truth; the inherent in anything. The ultimate explanation of the being of something. According to Aristotle, the primary source of all being, of all actuality and of all knowledge. (a) In ontology, the first principles are the categories or postulates of the ontology (b) In epistemology: the foundation of all knowledge. Frequent synonym of essential, universal, cause (Runes, 1998, p. 304).

It can be said that a principle constitutes the origin, root or primordial origin, principal or authentic and, at the same time, universal, essential and inseparable of the thing or object and that it provides the ultimate explanation of its existence.

According to the previous quotation, it seems that there are different types of principles:

You can talk about the principles of movement, that is, the starting point (...); ontological, that is, of the causes that originate other entities; and finally, we can talk about logical principles, which are the reasons on which any reason is based (Gutiérrez, 2007, p. 157).

It is interesting to highlight, in this work, the classification or typology of the first principles of science and, for this purpose, they are divided into 1) logical (the reasons on which the reasonings on being are supported) and 2) ontological (the causes that originate other entities).

It is also known that there are many "logics": addition, subtraction, multiplication, division, analysis, synthesis, induction, deduction, comparison, classification, definition, intuition, etc., and the different combinations that can be made between them.

Logic, in general, can also be understood as those intellectual operations or methodological procedures that the cognitive subject can perform to generate new knowledge about the beings being.

For reasons of space, this work will only address - by way of example - some of the first most important principles of two different and contradictory logics (if taken separately): inductive, formal or Aristotelian, and deductive, sensual or baconian, and their possible mixtures.

The logical-rational principles of knowledge

According to deductive logic, the first logical principles are valid for any science: "A principle is a true, absolutely obvious, universal and necessary proposition. Therefore, it does not need demonstration, but, on the contrary, it is supposed in any demonstration" (Gutiérrez, 2007, p. 157).

It is presumed that the first logical principles are true, obvious, universal and necessary for any demonstration.

Saint Thomas of Aquino, following Aristotle, proposes three essential characteristics of every first logical principle:

Conditions to be fulfilled by the truer principle (...) 1st. It must be a principle on which every error is impossible, since one deceives oneself about things he does not know; 2nd. It must not suppose any previous truth, since it is necessary to know anything; 3rd. It must be in us naturally, prior to any investigation of the spirit, since this investigation implies (Garrigou-Lagrange, 1980, p. 203).

It is assumed that every first logical principle that is true, autonomous and innate, can only be derived in a "rational" way, that is, the human soul tries to put "order" into reality.

Every principle refers to being and to what is preached of being:

The analysis of our ideas shows in an indisputable way that the idea entirely implicit in all others is the idea of being; From this it follows that the judgment must first be the subject, first of all, and as predicate, what firstly agrees to be (Garrigou-Lagrange, 1980, p. 203).

What is it that first suits the being? What is it that fits first with science?

Some first principles of deductive logic, and that are supposed to "suit" all science, are the following:

- Logical-rational principle of non-contradiction: "It is impossible to affirm and deny the same predicate to the same subject at the same time and under the same aspect" (Gutiérrez, 2005, p. 158).

What "first suits" the subject is that what is said of him (predicate), whether true or false, but not both qualities at the same time and under the same circumstances of time, mode and place. It is not correct to say, for example, that "the curriculum conceived as a set of courses or subjects is synonymous with plans and programs of study" and, at the same time and under the same aspect, deny that this is the case because the principle of no contradiction.

It can also be formulated as follows: "Two contradictory propositions cannot be true at the same time" (Gutiérrez, 2005, p. 158).

Contradictory propositions cannot be simultaneously true or simultaneously false because they differ in quantity and quality. It is incorrect to say, for example, that "every curriculum integrates the subjects or subjects" and at the same time to say that "some curriculum does not integrate the subjects or subjects" or that "no curriculum integrates the subjects or subjects" and, at the same time and under the same aspect, to affirm that "some curriculum integrates the subjects and subjects" because, it is insisted, the principle of non-contradiction would be violated.

- Logical-rational identity principle: "A is necessarily A" (Gutiérrez, 2005, p. 159).

It would not be correct to affirm that one thing is and, at the same time and under the same aspect, to deny that it is. It is another way of stating the principle of non-contradiction. "Aristotle says, from the logical point of view: 'It is impossible that the same attribute belongs and does not belong to the same subject, at the same time and under the same relationship'" (Garrigou-Lagrange, 1980, p. 204).

- Principle of excluded third: "There is no means between two contradictory propositions" (Gutiérrez, 2005, p. 159).

What first suits the being, entity, thing or subject is that what is preached on it, be true or false, but not both qualities at the same time and under the same relationship.

A scientific principle, derived from the logical principle of the excluded third party (there is no means between two contradictory propositions) that applies very well in the definition of curriculum - for example - is the following: "If the curriculum is a set of courses

or subjects not it can be understood as a set of experiences ”; “The curriculum is not conceived as a set of subjects”; then, "the curriculum is conceived as a set of experiences", there is no middle ground.

The logical-sensual principles of knowledge

Inductive logic, unlike deductive, goes from multiplicity to unity, from partiality to completeness, from complex to simple, from divided to compound. Bacon (1991) wrote the *Novum organum* (treatise on induction) privileging the sensual over the rational.

- Logical-sensual principle of observation and experimentation of phenomena: “Man, servant and interpreter of nature, neither works, nor understands more than in proportion to his experimental and rational discoveries about the laws of nature; out of there, nothing knows or anything can ” (Bacon, 1991, p. 37).

As an inverse process to deduction, induction goes from the singular to the universal. It is a reasoning, according to Gutiérrez (2005), where “from the observation of a constant relationship between phenomena, an essential and, therefore, universal and necessary relationship between phenomena is obtained” (p. 206) .

The experimentation is, in addition to a first logical-sensual principle, one of the four technical strategies to know the reality starting from the facts to the laws, from the particular to the general:

Much will have to be expected from the sciences when the spirit ascends by the true scale and by successive degrees, from the facts to the less elevated laws, then to the middle laws, rising more and more until it reaches the most general of all (Bacon, 1991, p. 72).

- Logical-sensual principle of multiplicity:
The human spirit feels naturally inclined to assume in things more order and similarity than in them; and while nature is full of exceptions and differences, the spirit sees everywhere harmony, agreement and similarity (Bacon, 1991, p. 44).

If the above quotation is carefully analyzed, it can be clearly stated that reason directs its attention to order and similarity, while the senses go in search of exceptions and differences. Perhaps this is because they constitute different cognitive faculties and because

they are different methods of knowledge: reason and the senses, the deductive and the inductive, respectively.

- Logical-sensual principle of divisibility: “Strong and penetrating spirits can fix and focus their attention on differences, even the most subtle ones; the elevated and reasoning spirits distinguish and gather the most insignificant and general similarities of beings” (Bacon, 1991, p. 47).

Similarities are best perceived with reason: reality stops, stagnates, order reigns, is invented, is simple, etc. Instead, differences are best appreciated with the senses: reality moves, changes, chaos reigns, is undetermined, is experienced, is multifaceted, complex, etc.

The first work of true induction, as regards the discovery of forms, consists in the separation and exclusion of each of the properties that are not found in all the experiences in which the given property is presented, or that appear in some experiments in which the given property is not found, which is seen to increase in certain experiments when the given property decreases, or decrease when it increases (Bacon, 1991, p. 106).

- Logical-sensual principle of complexity: “It is necessary to consider the body as the meeting and the addition of various simple natures” (Bacon, 1991, p. 89).

Is being simple (rational) or complex (sensual)? Who tells the truth: Aristotle or Bacon? It is assumed, for now, that the answer to these questions depends on the interests and needs of the researcher.

The ontological principles of science

The first logical principles are adequately related to the first ontological principles, that is, it is assumed that the being of beings is manifested in existence through language. To accept this it is necessary to resort to the definition of the concept of philosophy elaborated by Heidegger (2006) “A correspondent that translates the call of being of the entity into language” (p. 66).

If the term "entity" means any being, thing or object that has its own independent existence in reality, then the enunciation of the category named with the expression philosophy by Heidegger can be interpreted as the correspondence that can be established between the "entity" (as a possibility of existence) and the "being" (as experience) through

language; that is, as the manifestation of the "being" of the "entity" through expressions, phrases, words, phrases or voices; that is, that any "entity" or "thing" manifests itself in existence through communication.

The ontological-rational principles of knowledge

Some ontological-rational principles, which are related to the logical-rational principles already mentioned earlier in this work, are the following:

- Ontological-rational principle of identity: "Being is; not being is not" (Gutiérrez, 2005, p. 159).

For example: if it is true that the curriculum "is a plan to guide learning", it will be false to state - under the same relationship - that "the curriculum is not a plan to guide learning": "The same being cannot be and not be at the same time and under the same relationship" (Garrigou-Lagrange, 1980, p. 204).

The same curriculum cannot be a set of disciplines or subjects that make up the plans and programs of study in an educational institution, and not be, at the same time and under the same relationship.

- Ontological-rational principle of excluded third party: "Anything, whether or not it is, does not fit the middle ground" (Gutiérrez, 2005, p. 159).

A scientific principle, derived from the ontological-rational principle of excluded third party (anything is or is not, there is no middle term) that applies very well in the curriculum concept is the following: "Students approve a subject or do not approve it"; "It is not possible that they approve the matter in part and that in part they do not approve it."

- Ontological-rational principle of sufficient reason: "Every entity has a sufficient reason for its existence. Or: Every being has a sufficient reason to be" (Gutiérrez, 2005, p. 159).

If this first ontological-rational principle is carefully considered, it will be noted that it refers to being. Every phenomenon needs an explanation, a reason for being:

Everything that is, has its *raison d'être*, and consequently everything is intelligible; and no: everything is intelligible, consequently everything must have for us a reason for being. Just as intelligence knows being before knowing itself and is not intelligible in itself but in function of being (as a living relationship to being), while being is intelligible in itself; so she discovers the first principles in being, as laws of being, before discovering them as laws of thought; and these principles are not laws of thought (essentially relative to being), but because they are primarily laws of being (Garrigou-Lagrange, 1980, pp. 217-218).

What suits all beings first is that there is a sufficient reason for their existence, for their being, for their presence; this reason of being allows its "intelligibility". Intelligence (the logical) knows the being (the ontological) before knowing itself and is only intelligible depending on the being. That is why, in this section, the logical principles of science are analyzed first and then, in a second moment, to be able to understand its ontological principles.

The ontological-rational principle of sufficient reason is analogous to the ontological-rational principle of causality:

- Ontological-rational principle of causality: "Everything that exists has a cause of its existence ... even if the causes are denied, however, there remains the need for a reason to explain the being of things" (Gutiérrez, 2005: 160).

According to the deductive logic, there are two modes that "agree" directly to the being of the entities, one positive and one negative.

The positive way is to affirm that the being of the entities is "determined", its determined nature constitutes it properly, that is, it is "convenient":

We find two ways that suit every being considered: one positive and one negative

(...) The positive way is that each being is a certain thing (...). The supreme judgment that must affirm what first suits the being has, then, as a formula: "Every being is a certain thing, a determined nature that properly constitutes it." It is in this way that it is said without tautology: God is God ... A is A. If the proposition is given by subject to be, in the predicate it is necessary to

express the nature of the being, what defines it, and say no “the Being is being” but “being is what it is or can be”. And since it is clear that this first predicate suits the first subject by itself, the formula can be specified and said: "Every being is and is itself a determined nature that properly constitutes it." This formula is no longer a tautology; there is even a philosophy that denies its truth: the philosophy of becoming, captivated by sensitive appearances, which denies that there are things to admit but actions, that defines the real not for what it is, but for what is done and changes without cease, which refuses therefore to see real distinctions (Garrigou-Lagrange, 1980, pp. 206-207).

If you pay attention to the previous quotation, it will be possible to observe that the last judgments issued indicate that, in addition to the deductive logic, there is another, the inductive one that is not rational, but sensual and that can serve not to talk about products, but of processes

The negative mode that is supposed to "suit" every being considered, that is, every being of the entity, is "unity":

As for the negative mode that suits every being considered, it is unity, which opposes multiplicity, as the identity that opposes diversity (...). If every being is a certain nature, which properly constitutes it, follow that as such it is not divided; if it were divided it would be and it would not be under the same aspect what constitutes it. If it is simple, it is not only individual but indivisible; if it is composed, it ceases to be when it is divided (...), the unit, being a property of being, varies with it. In fact, the being is said first of the substance, after the quantity, of the quality, etc., of the different accidents that are by the way something real; in the same way the unit has the corresponding multiple meanings: identity is the unit of essence or substance, equality is the unit of quantity, similarity is the unit of quality. What expresses then the principle "every being is one and the same" is the functional identity of every being with itself (Garrigou-Lagrange, 1980, p. 208).

It is assumed that unity is opposed to multiplicity, identity to diversity, determinism to indeterminism, indivisibility to divisibility, the whole to the parts, the simple to the

complex, the compound to the divided, etc. That is, the first logical-rational (deductive) principles of science oppose the first logical-sensual (inductive) principles of science.

- Ontological-rational principle of rest or stillness:

Only being is, non-being cannot be (...) being is equal to matter, to full space, non-being is empty space. Therefore, there can be no empty space and, consequently, no movement, since this means that material things change places through empty space; and as the full being is found everywhere, there can be no change; matter remains matter in all circumstances, and all becoming and passing is deceptive appearance (Simmel, 1946, pp. 56-58).

The first logical-rational principle of identity, together with those of non-contradiction, excluded third, sufficient reason and causality, allow the being of the entity to be thought of eternal rest, stillness, tranquility, calm, peace, serenity, etc. This first ontological-rational principle (to suppose that the being is in eternal rest) is of the rational type.

Why can it be said that this first ontological-rational principle emanates, in the first instance, from reason, soul, spirit, intelligence, etc., rather than from the senses? It can be estimated that, while the sensual faculties (the senses) are interested in movement, in change; to the rational faculties (the reason) they are interested, however, the stillness or rest.

- Ontological-rational principle of order:

When an inner or outer voice tells us: "love your neighbor as yourself", the force of this demand does not come from this voice, but from the right of its content. The claim that it should be so is independent of someone having enforced it (Simmel, 1945, p. 137).

This first ontological-rational principle has its foundation, like the one that indicates rest or stillness, in the first logical-rational principles of non-contradiction, identity, excluded third party, sufficient reason, causality, etc. It seems that its origin is due to suppose that, metaphysically, there is an order that governs the being of the entity.

- Ontological-rational principle of determinism: "According to Plato, ideas come to things his being and his power to be known" (Simmel, 1945, p. 133).

It is assumed that the being of the entity, that is, reality, is determined - of origin - by metaphysical forces (the world of ideas). Being and knowing the entity, to say from this beginning, begins in the human soul.

Spinoza (1990) refers to this ontological principle in the following terms:

Anything singular, or put another way, everything that is finite and has a certain existence, cannot exist and be determined to produce any effect, if it is not determined to exist and produce this effect for another cause that is on its part finite and has a certain existence; and in turn, this cause cannot exist either and be determined to produce some effect, if it is not determined to exist and produce this effect by another cause that is also finite and has a determined existence, and so on to the infinite (p. 23).

A "metaphysical" order is conjectured that determines the being of the entity, that is, the physical order, the reality; that is, that singular and finite things exist and produce effects due to certain causes that, in turn, exist and produce effects due to other causes, etc .; hence the rational relationship of this first ontological-rational principle with its correlations of rest or stillness and order, respectively.

This leads him to affirm that the metaphysical plane determines the physicist: "The order and connection of ideas are the same as the order and connection of things" (Spinoza (1990, p. 38). That is, the world ideal is reflected as a real world. For Spinoza (1990), the rational order determines the subject: "As the thoughts and ideas of things are ordered and chained in the soul, the conditions of the same are correlatively ordered and chained in the body , that is, the images of things "(p. 163).

In Spinoza (1990), eternity is preceded to the present: "Everything that the soul knows as having a kind of eternity, does not know it because it conceives of the current existence of the body but because it conceives the essence of the body with a kind of eternity" (p. 174). That is to say, quietness, order, determinism, movement, chaos, the indeterminate are privileged.

Tschirnhaus (cited in Cassirer, 1986b) puts it in the following terms:

That which we conceive in a clear and clear way, without limiting ourselves to perceiving it through the senses, has a validity that can be extended by us to all other thinking beings, since the individual differences between men lie only in the sensitive capacity and imaginative, while the "intellective" ability is, in them, always the same and obeys in all the same conditions (p. 135).

Reason is privileged over the senses, unity over plurality, the rational over the sensual.

- Monistic ontological-rational principle:

Likewise, the being is indivisible, because next to the being there cannot be a second being, because as a being it would not be different from that; therefore, there can be no multiplicity of particular phenomena (...), "the same thing is thinking and what is thought," says Parmenides (...), "thinking and being are the same" (Simmel, 1946, p. 58).

The ontological-sensual principles of knowledge

Some ontological-sensual principles of science, which are related to the logical-sensual principles already mentioned above, are the following:

- Change or movement:

Heraclitus is the first thinker for whom the essence of the world is that he moves. For him, all matter is resolved in what happens with it. In the place of being defined and determined, it places the eternal succession of opposites in which the death of one form becomes the life of another. And as with everything particular, conceive the world as a whole in a constant becoming and passing (Simmel, 1946, p. 77).

If it is accepted that this first ontological-sensual principle is true, it would collide — first — with the logical-rational principles of non-contradiction, identity, excluded third, and — subsequently — with the first ontological-rational principles that indicate rest or stillness, order, determinism, unit, etc. This first ontological-sensual principle refers to movement or change, disorder, indeterminism, existence, unity, while all the previous first logical-rational and ontological-rational principles refer to stillness, tranquility, serenity, calm, tranquility, peace. This ontological principle is of the sensual type.

- Ontological-sensual principle of chaos: Bacon (1991) starts from reality to go back to the principles; that is, from chaos to order: "To penetrate the bowels of nature, it is necessary that both notions and principles be taken from reality" (p. 39)

However, it is always possible to find principles that indicate, in a necessary way, order: "If each one is to be treated, according to their merits, who would escape from being scourged?" (Simmel, 1945, p. 144).

Bacon (1991) looks like this:

There is neither, nor can there be more than two ways to investigate and discover the truth: one that, based on experience and facts, goes back immediately to the principles that acquire an unquestionable authority, judges and establishes secondary laws (middle axioms) (...) and another that, from experience and facts, induces laws, rising progressively without shaking to the most general principles that it ultimately reaches (p. 39).

That is to say, the truth is induced, starting from the experiences and the facts towards the principles. It may be the inductive-deductive method.

- The ontological-sensual principle of indeterminism: "In Protágoras' proposition that ' man is the measure of all things, of those that exist because they exist, of those that do not exist because they do not exist '" (Simmel, 1946, p. 106).

Considering carefully the aforementioned judgment, it is possible to observe that it derives from an ontological-sensual principle of indeterminacy of the being's being.

For Berkeley (quoted in Cassirer, 1986b), reality exists regardless of whether or not there is a subject that can perceive it: "The trees are in the garden, they are in it, love it or not want it, I already represented them or not; but this only means one thing: that I have only to go to the garden and open my eyes, to see them necessarily "(p. 253).

And that reality, for Locke (1994), consists of infinite moments of experiences: "If our weak faculties are not able to separate the succession of any kind of duration, our idea of eternity can only be one of infinite succession of moments of the duration in which something exists" (p. 321).

- Ontological-sensual principle of plurality: The first ontological-sensual principles mentioned in previous paragraphs, such as change or movement, chaos,

indeterminism and sensualism, allow us to understand reality as a plurality of events interrelated with each other.

The mixed ontological principles: Intervals of change / movement and / or movement / change.

For Kant (1996):

There is no doubt that all our knowledge begins with experience. Well, where would the faculty of knowing, for its exercise, be awakened, as if it were not by means of objects that hurt our senses and pray for themselves cause representations, now they set in motion our intellectual capacity to compare them, link them, or separate them and elaborate like this, with the raw material of the sensitive impositions, a knowledge of the objects called experience? According to time, then, no knowledge precedes in us the experience and all knowledge begins with it (p. 27).

From the above, it can be understood that the methodological procedures or intellectual operations to generate new knowledge (what most researchers call the method) can be reduced to additions, subtractions, multiplications, divisions, analysis, synthesis, inductions, comparisons, classifications, definitions, intuitions, etc., which constitute acts produced by the sensory and / or rational faculties of the cognitive subject caused by the impressions received from real or experiential life.

More if all our knowledge begins with the experience, that is not why it all originated in the experience. Well, it could be that our knowledge of experience was composed of what we receive through impressions and what our own faculty of knowing (with the occasion only of sensitive impressions) provides for itself, without distinguishing this addition from that fundamental matter until a long exercise has made us attentive to it and able to separate both (Kant, 1996, p. 27).

It is assumed that the cognitive subject, although his knowledge of reality derives from his experiences, it is also true that of all the impressions that are received, the only ones that become knowledge are those that fit within the possibilities of adding, subtracting , multiply, divide, analyze, synthesize, induce, deduce, compare, classify, define, intuit, etc.

That is to say, of the operations that can be carried out on it with its cognitive faculties: its reason and / or its senses. It is possible that it is the deductive inductive or deductive-inductive method, that is, mixed, recovering both Aristotle's ideas, such as those of Bacon and Kant.

Mixed ontological principles: Chaos / order or order / chaos intervals

“Everything real is rational (...). Hegel has introduced a new and more metaphysical concept of becoming by transporting the concept of evolution to the objective spiritual significance of things and of the event that is beyond all temporal reality”(Simmel, 1946, p. 94).

It is a principle of balance between chaos and order. The unity of opposites in an endless dialogue in the future, in such a way that it is possible to evolve towards the perfection of being, beyond time, space and circumstances.

- Intervals of indeterminism / determinism or determinism / indeterminism: "It would be said that man cannot bear being without elevating him to a duty to be, but also vice versa, that he cannot bear the duty to be without reducing it to being" (Simmel, 1945, p. 146).

It is believed that, in the case of a knowledge relationship, the subject (first) determines the object and, in turn, is determined by it (second). It can be the other way around: that the object (first) determines the subject and, in turn, this determines (in a second moment) the object.

It is suspected that the above refers to the principles of the dialectic, which tries to reconcile the opposites (the principles of the determined and the undetermined).

There is the following question: In what moments, places and circumstances the substance and / or accidents of the being of the entities are in actions, passions or states of movement and / or stillness, order and / or chaos, determinism and / or indeterminism, experiences and / or representations, monism and / or dualism, being and / or should be, sensualism and / or rationalism, transcendence and / or immanence?

It is estimated that this question admits not one, but several answers, depending, in the first instance, on the faculty and / or faculties that the cognitive subject uses to answer it.

If so, what will depend on the faculty (s) that the cognitive subject uses to solve the previous matter? In previous lines, it was asserted that they could be the passions or desires of the cognitive subject.

The concept, category, idea or notion of curriculum, at what moments, spaces and circumstances is elaborated from principles that indicate movement and / or stillness, order and / or chaos, determinism and / or indeterminism, being and / or duty being, unity and / or duality, sensualism and / or rationalism, immanence and / or transcendence?

The next topic will deal with the epistemological relationship between the principles of science and the concept of curriculum.

The logical and ontological principles of the curriculum concept. An epistemological relationship

In the presentation of the first thematic unit of the second edition of his book Curriculum Design based on competencies, Santiváñez (2013) says that "there are many definitions of curriculum as many as curriculum students" (p. 27). The question is obliged: why this fact?

Later, the same author adds: "The term curriculum has been conceptualized in different ways, at different times. This concept has undergone a historical evolution that has led some authors to define it from different perspectives and in different ways "(Santiváñez, 2013, p. 27).

Using the intellectual tools previously elaborated in sections one and two of this work, it is now time to review the concept of curriculum in the light of the logical and ontological principles of science.

The logical-ontological-rational principles of the curriculum concept

The definition of curriculum in the light of the logical-ontological-rational principles of science can be constructed as follows:

According to Santiváñez (2013), the curriculum can be conceived as a "set of courses or subjects" (pp. 28-29). Likewise, this same author reviews the following definitions (Santiváñez, 2013):

- "Set of disciplines or subjects that are studied in an institution or educational center" (siglo XVII) (Santiváñez, 2013, pp. 28-29).

The disciplines or subjects constitute an indivisible "whole" (unit) instituted (determined).

- “Set of disciplines or subjects that make up the plans and programs studied in an educational institution” (siglo XVIII) (Santiváñez, 2013, pp. 28-29).

The disciplines or subjects integrated into an inseparable whole (unit) make up the plans and programs (order) established (determined).

- “Is the educational program or an environment planned by the school” (Oliver, 1773; citado en Santiváñez, 2013, pp. 28-29).

The school establishes (determines) the planned environment or educational program (order)

- “Appropriate collection of subjects that can be studied separately or in reciprocal relationship. These subjects are logically predetermined in order to channel student learning ” (Richmond, 1971; citado en Santiváñez, 2013, pp. 28-29).

The subjects are "predetermined" in a logical way (respecting the principles of identity, not contradiction and third excluded) with the intention of "determining" the students with the contents. It can also be seen that reality is divided into two (adequate and inadequate) to justify the "exclusion" of "inadequate."

- “It is a planned series of meetings between a student and some selection of the branches of knowledge” (King y Brownell, 1971; citados en Santiváñez, 2013, pp. 28-29).

Everything that is "planned" intends to put "order" and "determine" those to whom it is addressed.

- “It is a plan to guide learning” (Taba, 1974; citado en Santiváñez, 2013, pp. 28-29).

"Planning" the orientation of learning is also synonymous with putting "order" in it to "determine" students.

Taken together, in each and every one of the previous definitions it is possible to observe that they were constructed from the logical principles of rational type: identity, non-contradiction and third excluded, related to the ontological-rational principles, also, of stillness, order, determinism, must be, monism, rationalism, immanence, etc.

Each and every one of these principles seems to indicate that the definition of the curriculum concept is more appreciated with reason, as a product, than with the senses, as a process.

However, the characteristics of the curriculum in the light of the logical-ontological-rational principles of science can be analyzed as follows:

From the definition of this term from the logical-ontological-rational principles of science, analyzed in the previous section, it is possible to determine that its characteristics also obey the same principles:

- “Its ordering is vertical and independent, offers little opportunity to relate the different knowledge” (Santiváñez, 2013, p. 28).

An "immovable order" is appreciated.

- “Emphasize the contents of the subjects presented in isolation from each other” (Santiváñez, 2013, p. 28).

“Stationary”, “still” contents, in “rest”.

- “It is synonymous with plans and programs of study” (Santiváñez, 2013, p. 28).

The "order" is observed.

- “The curriculum is seen as a fixed structure composed of subjects” (Santiváñez, 2013, p. 28).

It is a certain “fixed order”.

- “Your main concern is the content” (Santiváñez, 2013, p. 28).

The “put”, the “given” is privileged.

- “The teacher's role is to fill the student with knowledge, like a jug that pours water into glasses” (Santiváñez, 2013, p. 28).

The teacher "determines" the students with their knowledge.

- “It does not integrate the subjects or subjects” (Santiváñez, 2013, p. 28).

It is a "whole" whose parts are isolated performing different functions.

- “Transforming this curricular conception implies only changing, eliminating or adding subjects from the curriculum, without any curricular evaluation” (Santiváñez, 2013, p. 28).

Everything is changed so that nothing changes (stillness).

- “The role of the student is to” receive “the largest amount of content that the teacher” fills “in his memory, without any possibility of analysis, experience or research” (Santiváñez, 2013, p. 28).

The contents are "fixed" (immovable) and "determine" the student.

It is possible to conclude that each and every one of the characteristics of the definition of the curriculum analyzed were constructed - derived and as well as the preceding definitions - from logical principles of a rational type: identity, non-contradiction, etc., related to ontological-rational principles, also, of sufficient reason, causality, stillness, order, determinism, must be, monism, rationalism and immanence.

Each and every one of these principles seems to indicate that the characterization of the concept in question is more appreciated with reason, as a product, than with the senses, as a process.

This type of curriculum is constructed from a deductive logic that goes from unity to multiplicity, from complete to partial, from simple to complex, from compound to divided.

The logical-ontological-sensual principles of the curriculum concept

The definition of the curriculum in the light of the logical-ontological-sensual principles of science can be elaborated as follows:

The curriculum can also be conceived as a set of experiences: "This conception arose in recent years, which is characterized by being centered on the learning experiences that the student lives, and that are integrators of the entire educational process" (Santiváñez, 2013, p. 29).

It is also said that "this conception arises at the end of the 19th century, and becomes more important to be applied in the sixties and seventies of the last century, despite the validity of the subject-centered curriculum" (Santiváñez, 2013, p. 30).

It is estimated that the logical-ontological principles of the curriculum are beyond time, space and circumstances because, as will be shown later, they are based on certain interests.

According to Santiváñez (2013), some more definitions of the curriculum concept are the following:

- "Curriculum is a set of experiences, whether intended or realized or in realization that have the potential to reconstruct the human experience" (Duncan y Frimier, 1971; citados en Santiváñez, 2013, p. 31).

Principles or causes such as "experimentation" and "change" or "movement" are appreciated.

- “Curriculum is a program of experiences designed so that learners reach, to the greatest extent possible, certain educational goals and objectives” (Hirst, 1974; citado en Santiváñez, 2013, p. 31).

Again, principles or causes such as "experimentation" and "change" or "movement" can be observed.

- “Curriculum are intentional activities and organized, oriented and systematized experiences that life would not provide without help” (Musgrove, 1978; citado en Santiváñez, 2013, p. 31).

Behind this definition you can observe logical or sensual principles or causes of science such as "observation" and "experimentation."

- “Curriculum is a set of learning experiences that the subjects of education live in a specific society and historical process, which have been planned in order to boost their own integral development as people and as an organized society” (García, 1975; citado en Santiváñez, 2013, p. 31)

Ontological-sensual principles or causes are considered as "experimentation" and "movement" or "change."

Taken together, in each and every one of the previous definitions it is possible to observe that they were constructed from logical principles of a sensual type: induction, observation, experimentation, multiplicity, divisibility, complexity, related to the sensual ontological principles, also, of change or movement, chaos, plurality, indeterminism, pluralism, empiricism, transcendence, etc.

Each and every one of these principles seems to indicate that the definition of curriculum is more appreciated with the senses, as a process, than with reason, as a product.

The characteristics of the curriculum in the light of the logical-ontological-sensual principles of science can be constructed as follows:

Santiváñez (2013, p. 30) lists some of the most important characteristics of this type of curriculum:

- Experiences are programmed to achieve the desired objectives.

Principles or causes are observed as: "experimentation".

- You specify what types of changes you want to achieve (objectives and competencies).

Principles or causes such as "movement" or "change" are appreciated.

- Requires the work of a teacher to schedule experiences.

Principles or causes are considered as: "experimentation".

- It necessarily requires the direct (or indirect) relationship between subject and environment, through observation.

Principles or causes such as "movement" or "change" and "observation" are estimated.

- It is a dynamic and flexible conception where the student develops the curriculum by living it, according to his reality and the moment.

Principles or causes such as "experimentation" and "change" or "movement" are valued.

- Take advantage of the diverse experiences lived by the student inside and outside the classroom.

Principles or causes such as "experimentation" and "change" or "movement" appear.

- It allows the student to learn by doing and thus achieve a more useful learning for his future life

Principles or causes are valued as: "process" and "experimentation".

Taken together, in each and every one of the previous characterizations it is possible to observe that they were constructed from logical principles of the sensual type: induction, observation, experimentation, multiplicity, divisibility, complexity, etc., related to the sensual ontological principles, also, of change or movement, chaos, plurality, indeterminism, pluralism, empiricism, transcendence, etc.

Each and every one of these principles seems to indicate that the characterization of the concept in question is more appreciated with the senses, as a process, than with reason, as a product.

This type of curriculum is constructed from an inductive logic that goes from multiplicity to unity, from partiality to completeness, from complex to simple, from divided to compound.

The mixed principles: logical-ontological-rational and logical-ontological-sensual of the curriculum concept

Curriculum can also be conceived as a system: “The curriculum as a system is a set of interrelated elements or units, which, in turn, interact through different processes to achieve a common objective such as the integral formation of the student” (Santiváñez, 2013, p. 32).

In this definition as a system, logical-ontological-mixed principles or causes can be appreciated, that is, both rational and sensual: the “unity” can be seen in the “system”, where the “multiple” acquires meaning through “intermittent states”, Between movement and stillness, order and chaos, determinism and indeterminism, duty to be and being, duality and multiplicity, the rational and the sensual and the immanent and the transcendent in an endless dialogue between the logical-rational and logical sensual principles or causes:

The curriculum has five elements: profiles, objectives, competencies, contents, teaching strategies and evaluation strategies, all of which constitute a structure and are developed through four processes that are the following: curriculum design, curriculum implementation, curriculum execution and evaluation curriculum (Santiváñez, 2013, p. 32).

The above is manifested both in the reasons that support the rationale for the curriculum and in the causes or principles that originate it.

The implementation of the elements and curricular processes leads to the elaboration of a series of curricular products that are constituted by the curricular plan or Basic Curriculum Structure, the educational materials, the evaluation registration documents, the didactic interactions, the educational climate and assessments of the different elements, processes and the curriculum products themselves (Santiváñez, 2013, p. 32).

The passions, emotions and feelings of the human being, his needs and desires, move his will and his intentions by putting into action his faculties (reason and / or his senses) that allow him to act to build a curriculum to his liking, depending on the weather, place and circumstances in which it operates.

This conception of the curriculum allows the teacher to “identify its basic elements, recognize its manifestations when it goes through the different processes and, fundamentally,

conceptualize the curriculum as something unfinished, dynamic and structural in nature” (Santiváñez, 2013, p. 32).

You can observe logical-ontological-rational and / or sensual principles or causes such as: intermittent states between order and chaos, stillness or change and movement, between the elements of the curriculum determined by the unit.

According to this conception: "The curriculum manifests itself as a complex reality, where its guiding and instrumental elements go through various processes of creation, experimentation, readjustment and evaluation" (Santiváñez, 2013, p. 32).

The curriculum is still a complex whole (unit) because the elements that comprise it are in intermittent states between stillness and movement or change, order and chaos, the determined and the indeterminate, the being and the duty to be, the dual and the multiple, the rational and the sensual, the immanent and the transcendent framed in unity.

The definition of the curriculum in the light of the mixed principles: logical-ontological-rational and logical-ontological sensual of science can be constructed as follows:

Following Santiváñez (2013) once again, some definitions of the curriculum concept are the following:

- “The curriculum consists of the means to implement certain determined purposes of the school process” (Kung, 1971; citado en Santiváñez, 2013, pp. 32-33).

It is possible to appreciate mixed principles or causes: logical-ontological-rational and sensual as the following: intermittent states between "stillness" and "change" or "movement" and "determinism" and "indeterminism" that allow a definition of concept in terms of process.

- “The curriculum is made up of content, teaching methods and purposes. These three dimensions in interaction constitute the operational curriculum ” (Tyler, 1973; citado en Santiváñez, 2013, pp. 32-33).

Mixed principles or causes can be estimated: logical-ontological-rational and sensual as the following: intermittent states between "stillness" and "change" or "movement" and "determinism" and "indeterminism" that allow a definition of curriculum in terms of process.

- “The curriculum constitutes a methodological resource that represents the relationships between a set of elements that are linked based on a specific explicit objective,

which makes sense based on the historical contextuality that serves as the basis" (Guedez, 1989; citado en Santiváñez, 2013, pp. 32-33).

Mixed principles or causes are valued: logical-ontological-rational and sensual as the following: intermittent states between "stillness" and "change" or "movement" and "determinism" and "indeterminism" that allow a definition in terms of process.

The characteristics of the curriculum in the light of the mixed principles: logical-ontological-rational and logical-ontological sensual of science can be elaborated as follows:

Taken together, in each and every one of the above definitions it is possible to observe that they were constructed from mixed principles or causes: logical-rational and sensual: inductive-deductive, observation, experimentation, unity-multiplicity, divisibility-composition, complexity -simplicity, etc., related to mixed principles: ontological-rational and sensual, also, of stillness and / or change or movement, order and / or chaos, plurality and / or singularity, determinism and / or indeterminism, unity and / or plurality, rationality and / or sensuality, transcendence and / or immanence, etc.

Each and every one of these principles seems to indicate that the definition of the curriculum concept is appreciated both with reason (as a product) and with the senses (as a process).

This type of curriculum is constructed from an inductive-deductive logic that goes from multiplicity to unity and vice versa, from partiality to completeness and vice versa, from complex to simple and vice versa, from divided to compound and vice versa, in an endless dialogue in time, space and circumstances.

Conclusions

The answer to the question: What is the epistemological relationship between the logical and ontological principles of the curriculum concept? It can be given in the following terms:

The logical and ontological principles of science - respectively - are related to the different conceptions of curriculum from the respective circumstances of mode, time and place in which the notions about the latter are constructed. The diversity of definitions, characterizations, functions, purposes, elements, etc., which - on the mentioned concept - have been elaborated throughout the history of curriculum development obey certain

ontological (referred to being) and logical principles (referred to the reasons that support the rationing about being) that have their origin, mainly, in the existential needs of the cognitive subject.

Then, the parameters of exploration, description, explanation, interpretation or understanding that were found in the research and that are suggested to be taken into account to elaborate the different and contradictory definitions, characterizations, functions, purposes and elements of the curriculum concept are the following : the ontological principles of science (stillness and / or movement, order and / or chaos, determinism and / or indeterminism, being and / or should be, unity and / or duality or plurality, the rational and / or sensual, the immanent and / or transcendent) that are determinants of its logical principles (the reasons on which judgments about reality will be supported), the cognitive faculties (reason and / or senses) with the one or those that the cognitive subject intends to solve the knowledge problems, the assumptions in which - by doing this - it is irremediably located and the existential needs of the cognitive subject.

The above is proposed because the idea of curriculum - like any other category that every cognitive subject intends to build - part of certain ontological and logical principles that, in turn, obey the cognitive faculty or faculties that are used in its elaboration depending on certain interests that, in the same sense, obey certain needs located in time, space and existential circumstances.

These principles are related epistemologically in the different constructions of the mentioned concept, carried out by the main scholars of the subject and, because of this, the conceptualizations about it, differ in existential meanings, senses and consequences.

The definition of the curriculum concept depends on the space, time and circumstances of the person who produces it.

Circumstances are understood the passions, emotions and feelings of the human being; your needs and desires; that move your will and your intentions by putting into action your powers (reason and / or your senses) that allow you to act to build a "curriculum" to your liking.

The definition of the concept discussed here is a political problem with no definitive solution that is neither good nor bad, nor worse, nor better, simply is, and produces positive consequences for some and negative consequences for others.

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