Experimental model. Historic and conceptual revision[1]

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The qualification of the new knowledge is one of the oldest problems in experimental science. For this reason, one of Science s' priorities has been the search for experimental model, in order to produce knowledge in a more standardized way.

The importance of inferring a knowledge generation s' model has derived from the need to exactly understand the mechanisms that generate these data. The greatest advantage of the experimental model is to allow understanding preditions and controling of the results and the method and, at same time, keep the bioethical principles concerning the *d'hima nobile* ."

To define E"xperimental Model 'has been controversial in the different areas. The difficulties in its definition comes from each area complexity and from the fact that a term demand other terms that are ambigous or used in a different sense.

Individually, each definition is not sufficient to clearly describe its meaning. Thus, in general, one definition comprehend a little facet inside its own approach.

Historically, the term r"modulus "(from latin, derived from *r"modus* ,"little measure) is used since 23 B.C. throughout the eighteenth century. From the eleventh to fourteenth century, the used term was s"tandard "and r"mould ;"from the fourteenth to sixteeth century, r"measure " and from then on, r"model ."

From the seventh to nineteenth century, the model definition were mainly aimed at abstract models. For example, the philosopher Blaise Pascal, around 1650, described model as an act of spirit in which we can inspire ourselves *(ouvrage d 'esprit dont on peut s 'inspirer)*. In the eighteenth century, the French encyclopedia, dated 1765 defines model as a generic sense, an original pattern, proposed to be copied or imitated by anyone. Horst Koller, in 1969, defined model as a simplified representation of reality derived only from abstraction and Brockhaus, in 1971, defined it, as a pattern, ideal, reproduction or graphic of things (enlarged, reduced or at natural size). At that time, model was a simplified representation of a part of reality, that could be material or idealistic, concrete or abstract and would describe a future or present state.[1]

The English language dictionaires describe model as a three dimensions representation in a reduced scale; a simplified description of a system; figure to be reproduced in any material; specific design or style of a structure or convenience; exemplary person, thing or ideal; example of person or thing to be copied or imitated; person to pose or be shown; its piece or copy.[2]

The profusion of meanings for model makes it difficult to conciliate and specify the term. The Oxford Dictionairy[2] inscribes about 40 meanings (with subsections). William de Humboldt e Ludwig Wittgenstein justified this amount because, for them, the language dwells in its use.

On the other hand, Wolfgang Brezinska[3], Pedagogy teacher of Konstanz University, accomplished a 20 pages extensive work about 15 meanings of model, conluding that only one meaning was most useful to pedagogy: t"eaching material for ilustration or exposition of an original ."

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Historically, the importance of model has been stressed . In 1868, the pragmatism founder, Charles Sanders Peirce, conceived: "We are not able to think without symbols ." This theory of symbols also became a model of theory. Percy W. Bridgman, em 1927, wrote in his famous book "The Modern Physics Logic :" I "believe that model is an useful and inevitable thinking tool, that allow us to think about the non-familir starting from the familiar ." Em 1949, Karl W. Deutsch[4,5,6], political and social scientist, formulated: "Men think in terms of model ."

Herbert Stachowiak, in 1973, mathematician and philosopher, went further and postulated: "All cognition is cognition in models and for models " and Christian Wissel, in 1989, declared: "The human spirit is not able to think in any way but in models ."[1]

In every case, the models are analyzed concerning to its pertinence. That is, if they are capable of representing the aspects of the determined empirical process and present, with sufficient precision, so as to satisfy the purpose. The correspondence or lack of correlation between a model and reality must be stabilished.

In 1969, a russian philosopher, Viltor A Stoff described five functions for model related to Science: experimental research; something specific of reflection; abstraction of a specific thing; scientifical interpretation and explication; experiments. And, finallly, Stachowiak, in 1973, distinguished the scientific models between: didactical model (demonstrational); experimental model (or heuristic model) for research and exam of hypothesis; theoretical model for knowledge transmission and operational model.[1]

Since then, the literature concerning the topic has been scant. There are not recent articles that deal with more modern model concepts, such as, in the psychodynamics, through archetypes, and in the neurolinguistic area, through paradigms.

In Portuguese language there are many Health area applicable definitions of model described in the dictionaires: "Figure produced in clay, wax or gypsum, destined to be reproduced in stone, marble or bronze (rubric: sculpture); three dimensional reproduction, enlarged or reduced, of any real thing, used as didactic appeal (e.g. human body parts, universe...); logical system constructed on basis of direct observation accessible data, that tries to describe and explain the linguistic system functioning, inclusively its unapproachable aspects through direct observation ."[7] "Drawing or image that represents what is being repreduced, drawn, painted or sculptured ;" "everything that serves to be imitated ."[8] "Object destined to be reproduced by imitation ;" "little scale reproduction of something that will be executed in large ;" "mold ;" "that which serves as an example or norm ."[9]

And the "experimental" definition have been described in the Portuguese language dictionaires as "related to experience; founded or based on experience; empirical; only derived from experience; that uses experimentation (research, study, method, ...) ." "Related to experience; experimental ." "Experience (from latin *experientia* ," from the verb *experiri* ," "experiment)," as "act or effect of experimenting; experiment ;" "life practice ;" "proof, demonstration, attempt, assay ."

Independently of area and several definitions, the meaning of "Experimental Model ," which expresses its functional and descriptive form, remains being the 1973 Stachowiak s,' which is the heuristic model, that is, which defines as any example that uses the analytical method for research and hypothesis inquiry.

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