

Fundamental research concepts and viewpoints

Tô Duy Hợp

Prof. Dr., Director of the Center for Thinking Science, Vietnam Union of Science and Technology Associations

Email: toduyhop42@yahoo.com

Received 20 September 2015; published 2 March 2016

Abstract: *This article analyzes connotations of the fundamental research concepts at 3 levels from primary, basic, and secondary, what points out the inextricable problem in form of dialogic notions. Simultaneously, the article also clarifies a certain viewpoints on fundamental research such as simplified and/or complicated, Marxist and/or Non-Marxist, positive and/or anti-positive, modern and/or postmodern; indicates the state of dilemma among viewpoints on fundamental research. These two states can be comprehended and resolved based on some main frames of theory founded from contemporary philosophy and science as the Paradigm of Complexity by Edgar Morin and Disrespect/Respect frame by Tô Duy Hợp and associates.*

Keywords: Fundamental research (pure and constructive), applied research, development research

1. Concept of Fundamental research

Primary connotation of Fundamental research concept

“Research”, as at the Great Vietnamese Dictionary, means “to consider, to ease comprehension, and to give solutions”, whereas “primary” means “to be a foundation or root in a system” (*the Great Vietnamese Dictionary*, 1998: 464, 1197). Either study or research or investigation is a type of human’s

activities, but such activities are all not research or study or investigation. Teaching and learning are not research^(*). Normal awareness in daily life is not research. Manual or simple labor is not research. Reproductive activities are not research. Daily communication or entertainment are not

^(*) The so-called “Study” in learning processes is not its that meaning; it is just an awareness of results of true researches.

research. Relaxing cannot be research, either. Because *research is a special type of awareness, thinking and attention activity with an aim to make a new product rather than any previous archetype that has been available in one's daily awareness, thinking, and action*. Research in the philosophy and specific sciences is a type of *creation*, or *detection*, or *statement* to possess new knowledge, methods or technologies. A primary thinking nowadays states that *Fundamental Research* is not *Applied Research* and cannot be *Development Research*. A primary boundary between *Basic research* and *non-basic research* (inclusive of *Applied research* and *Development research*) is made. When it comes to looking at researchers, it can be easily seen that a few of them can do basic research, which is a scarce ability^(*). Many researchers can join applied researches at different levels and stages, which is a popular ability. Development research offers many researchers to participate in simultaneously or at different stages, which is a popular ability as well.

Basic connotation of Fundamental research concept

Let us consider a definition of *Basic Research* in the *Vietnamese Dictionary*:

(*) In the Western philosophy, they are Aristotle, Plato, Democritus, Heraclitus, Socrates, F. Bacon, R. Descartes, G. Berkeley, I. Kant, G.W.F. Hegel, K. Marx, A. Comte, ... In the Western science, they are Euclid, N.I. Lobachevsky, Pythagoras, G. Cantor, G.W. Leibniz, Galileo Galilei, I. Newton, A. Einstein, N. Bohr, W. Heisenberg, D. I. Mendeleev, C. R. Darwin, A. Comte, K. Marx, M. Weber, ...

“Basic Research... scientific activities that aim to detect properties, relationships, objective rules of something or a phenomenon. Its results are manifested at detection of new properties, phenomena, relationships, objective rules, which help build up logical deductions or new concepts, viewpoints, hypotheses, or theories so as to more profoundly reflect objective connotations of things or phenomena.” (*the Vietnamese Dictionary*, edition 3, 2003: 116). There is a consistency of “General Research” and “Scientific Research” and not any distinctness between *Basic Research* and *Non-basic Research*. Although there is a crucial recognition about *Basic Research* which is “... to build up logical deductions or new concepts, viewpoints, hypotheses, or theories so as to more profoundly reflect objective connotations of things or phenomena,” but there is no distinction between “newly basic thing” or “newly non-basic thing”. Besides, this concept has not clarified basic archetypes of *Basic Research* in philosophy and a specific science. Asso. Prof. Dr. Vũ Cao Đàm was able to clarify differences between *Scientific Research* and *Basic Research*. At response for a question: “What is scientific research?”, he said: “Scientific research is to satisfy demands for awareness and improvement of the world: 1- To detect instinct connotations of things or phenomena (hereinafter referred to as things); 2- To detect motor rules of things; 3- To apply such rules to create solutions that affect such things” (Vũ Cao Đàm, 1996: 23).

Scientific Research, he said, has fundamental functions as follows: a- Description, b- Explanation^(*), c- Prediction; d- Creation (Vũ Cao Đàm, 1996: 23-26). *Scientific Research*, in general, has features as follows: i- New, ii- Reliable, iii- Informative^(**), iv- Objective, v- Risky, vi- Inheritable, vii- Individual, viii- Non-economical... (Vũ Cao Đàm, 1996: 28-32).

What differences, basically, between *Basic Research* and *Non-basic Research*? As a type of research, “*Basic Research* is one that detects natures and rules of things or phenomena in the nature, society, or human, etc. Results of the basic research have always been reasoning analyses, conclusions for rules, laws, or theorems, etc. From such results, finally, researchers deliver discoveries, creations, inventions that all build up theories of general values for a variety of fields” (Vũ Cao Đàm, 1996: 33-34).

Applied Research is a kind that is distinct from *Basic Research*: “*Applied Research* is application of rules resulting from *Basic Research* (normally *Oriented Basic Research*), aiming to propose principles for solutions, maybe inclusive of technologies, products, materials, equipment; the research applies results

from applied research into a new environment of things or phenomena. A solution is understood at the largest meaning of this term: it might be a solution of technologies, materials, or management” (Vũ Cao Đàm, 1996: 38). *Development Research* is a different type comparing to the said others: “In some UNESCO’s papers, *Development* is also called *Experimental Development* or *Technical Experimental Development*; or *Development Research* as it is called in the *Scientific Dictionary Contemporary*. Its typical feature is to apply the rules (collected from *Basic Research*) and principles (collected from *Applied Research*) so as to produce *samples* with parameters of *technical feasibility*” (Vũ Cao Đàm, 1996: 39-40).

A difference between *Basic Research* and *Non-basic Research* is manifested at inputs (queries and research hypotheses), and outputs (results). To summarize, *a real nature of Basic Research is a type that focuses on basic events to learn basic problems, propose basic hypotheses so as to discover profound instinct, detect fundamental rules of things or phenomena in the nature, society, and thought; on this basis, root theories are built to be a fir needle for practices that may improve human’s world*^(*).

(*) According to M. Weber, it is necessary to learn before explanation, and purposes of research are to approach *Verstehen* (= deep understanding of the meanings) of events.

(**) In a broad meaning, in an information pyramid, its bottom is the Data, above is the Information, above more is the Knowledge, then Wisdom.

(*) A typical example about basic research projects: - In the philosophy, it is “*Metaphysics*” (Siêu hình học) and “*Organon*” (Bộ công cụ) by Aristotle, “*Novumorganon*” (Bộ công cụ mới) by F. Bacon, “*Purely reasoning critique*” by I. Kant, “*Science of Logic*” by G.W.F. Hegel, “*Positivist philosophy*”

Thorough connotations of Fundamental research concept

A fundamental concept just outlines basic archetypes of a subject that the concept reflects and/or creates. To have a thorough concept, non-basic archetypes shall be supplemented. For *Basic Research*, beside above, crucial signals can be added as follows:

In the book with quotations by Vũ Cao Đàm, he recognized that “*Basic Research* can be done basing on theoretical studies... *Basic Research* can also be done basing on observations or experiments, measurement of expressions, impacts or effects of any unknown rule... Researches of theories or practices as above have been repeated many times with variable parameters, until truths of hypotheses are confirmed” (Vũ Cao Đàm, 1996: 33-34).

So *Basic Research* has been a dialectical contradiction process, which means it has two processes *Basic Theoretical Research* and *Basic Experimental Research* that both conflicts and unifies with each other. This status is dialogic, which means to be opposite/compatible: one side is bi-opposite with a formula “either *Basic Theoretical Research* or *Basic Experimental Research*”; the other

side is bi-compatible with a formula “both *Basic Theoretical Research* and *Basic Experimental Research*”^(*).

“*Basic Research* is divided into two kinds: *Purely Basic Research* (*Free Basic Research*) and *Oriented Basic Research* (*Exploratory Research*). *Purely Basic Research* is called *Free Basic Research*, or *Non-Oriented Basic Research*. This kind of research solely aims at figuring out natures and rules for natural and social phenomena to enhance awareness; there has not had any application into specific human activities. *Purely Basic Research* in general has individual characteristics, or it at least is played a major role by a prestigious researcher. In this case, the researcher is entitled to decide which subject of the research, and how to independently carry out it, which may not rely on any decision makers^(*). *Oriented Basic Research* is the one that its application was anticipated... it is also called *Exploratory Research*; for instance, Pasteur did a series of experiments to test his assumption about a rule that grows a disease due to virus. This is an *Exploratory Research* because it plans its application on finding how the

by A. Comte, “Dialectics of Nature” by F. Engels, “Materialism and Experienced Criticalism” by V.I. Lenin,...

- In specific sciences, it is the Euclidean geometry axiomatic system, principles of Newtonian mechanics system, Einstein's theory of relativity, the quantum theory of Bohr-Heisenberg, Mendeleev periodic table, Darwin's theory of evolution, the “Capital” of Marx, etc.

^(*) In physics, for instance, *Basic experimental study* of A.A. Michelson (accurate measurement of the speed of light in vacuum) is a fully independent process from the *basic theory study* of A. Einstein (a quite limited theories); while Galileo combined the *Basic experimental study* (precise measurement of marbles' speed rolling on an inclined plane), and the *Basic theory study* (discovery of rules of motion inertia motor) in a *basic physical research*, contributing to building up the *Newtonian mechanics principle*.

disease develops. He went to an assumption that if the body gets weak virus, animals are able to resist the disease created by that kind of virus. UNESCO divides the *Oriented Basic Research* into *Background Research* and *Thematic Research*. *Background Research* is the one that is based on observations, measurements to collect data so that understanding and rules of nature can be explored. This kind of research is inclusive of epidemiological studies in a medicine area to describe health distributions in a community; basic surveys on natural resources and conditions (geological survey); studies on oceans, atmosphere, meteorology, and chemical synthesis; studies on nature of physics, chemistry, biology of materials. *Thematic Research* is the one done in systems of a special phenomenon in nature, the plasma status, for example, of materials, cosmic radiation, genetics. This kind of oriented basic research leads to not only crucial theories but also significant applications in economics and other social fields” (Vũ Cao Đàm, 1996: 34-38).

Through concepts of the *Basic Research* from a primary connotation, to a fundamental, then thorough connotations, a problem can be seen in a way of pairs of opposition/merger; there are at least 3 pairs of opposition/merger as follows: 1- pairs of opposition/merger of *Basic Research* and/or *Non-basic Research* (= *Applied Research* and/or *Development Research*); 2- pairs of opposition/merger of *Basic Theoretical*

Research and/or *Basic Experimental Research*; 3- pairs of opposition/merger of *Purely Basic Research* and/or *Oriented Basic Research* (= *Background Research* and/or *Thematic Research*).

2. Some concepts about Basic Research

There are different opinions about the *Basic Research*. Furthermore, among opinions about the *Basic Research*, the *Dilemma* is created, which means important pairs of *Thesis* and/or *Antithesis* are as follows:

Simple concepts and/or Complex concepts about the Basic Research

The Simple concept about the *Basic Research* is totally separated from *Basic Research* and *Non-basic Research*. This trend often appears in some philosophical studies and basic scientific studies, especially in a phase of ancient philosophy and science. The complex concepts about *Basic Research* go against the simple concepts stated above about *Basic Research*, which considers that even the so-called *Purely Basic Research* is not thoroughly pure, because a relation between “pure” and “non-pure” manifests a dialectical contradiction, which means it has a logical opposition/merger: on the one hand, they are oppositions that can be mutually exclusive; but on the other hand, they can be intrusive to make a unity among such oppositions. A relation between *Basic Research* and *Non-basic Research* also has a characteristic of logical opposition/merger: both being

bi-opposite (between *Basic Research* or *Non-basic Research*), and *bi-compatible* (between *Basic Research* and *Non-basic Research*).

The simple and complex perspectives about the *Basic Research* create a dilemma status: it is an opposition/merger between a *thesis* and *antithesis*. This means an opposition or inter-exclusion of two above concepts are not an only status. Because there are many other statuses that have an important intermediate characteristic such as combining two concepts to make a new appropriate concept; or an eclecticism or ambivalent concept can be selected which is both simple and complex in a long term study process of phases or a collective project of many people with different approaches and supplements.

Marxist and/or Non-Marxist concepts about the Basic Research

The Marxist concept about *Basic Research* in philosophy and specific sciences is based on a *Dialectical Materialism* and *Historical Materialism* composed by the *Marxism*. Accordingly, theoretical and experimental studies on *Natural Material Foundation*, *Socio-Economic Infrastructure Foundation* have always been basic researches that lay a basis for the whole awareness process (reasoning/science) and activities (practice/life). The Non-Marxist concept on *Basic Research* is based on going against the *Dialectical Materialism* and *Historical Materialism*; *Metaphysical Materialism* or *Idealist Metaphysics*; the eclecticism (neither mate-

rialism nor idealist, neither total symptoms nor profound metaphysics). All of these various approaches are in common, which is to go against the Marxism or the Communism advocated by Marx. In the concept of *Basic Research*, either it is thought that studies about spiritual, socio-cultural foundations are more basic than ones about material, socio-economic foundations; or it is thought that two above types shall be combined to make a real *Basic Research* in the philosophy and specific sciences.

Two concept systems of Marxist or Non-Marxist about *Basic Research* had been in opposition in a history of the philosophy and specific sciences; however, later and now, they are in dialogues, even cooperation; as a result, a *dilemma* is created among Marxist concepts and/or Non-Marxist concepts about the *Basic Research*. An opposition/merger of the concept has various expressions: opposites, competition-cooperation, ambivalence, eclecticism, with adjustment or change of the concepts.

Realization and Non-realization concepts about the Basic Research

There is a decomposition between a realization concept and a non-realization concept about the *Basic Research* in the Non-Marxist approach.

The realization concept, in a philosophical aspect, is closed with the *Middle Way*: neither Materialism nor Idealism; the third approach is needed in the philo-

sophy. In an aspect of specific sciences, there is a similarity between a realization concept and the Marxist concept when the *Holistic Perspective/Approach* has been more appreciated than the *Non-Holistic Perspective/Approach*, a communism is more appreciated than an individualism, for instance. People of the realization think that the experimental research is the basic research; every theoretical study shall follow a rule of *simplification towards experimental basis*; if failing the rule, the theoretical study becomes invalid. In the *simplification towards experimental basis*, projects about *Cause - Effect Rules* and a diagram of analysis - synthesis of quantitative accuracy, which is a dependent, independent, eclectic, interruptive *correlation diagram between the variables*, aiming to enhance an *objective, scientific explanation ability* are all appreciated. A non-realization concept, in a physiological aspect, may protest against the eclecticism by the idealism or metaphysical materialism, not by dialectical materialism or historical materialism of the Marxism. In an aspect of specific sciences, the *Individualistic Perspective/Approach* is appreciated. It is thought that studies on an individual, individual actions, micro-reactions are all more basic than collective actions or macro-processes; because in order to explain the cause-effect, meanings of human behaviors shall be learned, and deep understanding (*Verstehen* - a unique term by M. Weber) about meanings of events is the most *Basic Research*; in other words,

Deep Understanding is more basic than Explanation. Correspondingly, *Quantitative Basic Research* is more important than *Qualitative Basic Research*.

In fact, these concepts protest against the other in early phases, then continue go against between people of extreme concepts. In later phases, and even nowadays, they are closer and supplement to make a more comprehensive concept: a combination of *Theoretical Basic Research* and *Experimental Basic Research*, *Quantitative Basic Research*, and *Qualitative Basic Research*, *Research of Insights* (the meaning) and *Explanatory Research* (cause-effect) at different ways and levels.

Modern and/or Post-modern concepts about the Basic Research

The Modernism is based on an ancient perspective/concept of philosophy and specific sciences. Accordingly, a theoretical paradigm, *Grands Récit* (the term by J. F. Lyotard) are worthy the basic research. An outstanding approach of the modernism about *Basic Research* is to highlight the *Reductionism* and the *Determinism*. This is a foundation for an extremism such as the Scientific Materialism, Physical Idealism, Critical Empiricism, Critical Rationalism, etc. The Postmodernism, earlier, was a protest against the Modernism, which claimed to destroy the *Grands Récit* of the philosophy and specific sciences; it shall be replaced by the *Postmodernist Discourse of Antireductionism* and *Anti-*

determinism. However, people following an extreme postmodernism and ones who would like to prolong life of the modernism by the *Late Modernism* have been closed together; as a result, a *dilemma* between the Modernization Perspective and/or Postmodernization Perspective about the *Basic Research* has been created.

An important expression of the dilemma between the modernization perspective and/or postmodernization perspective about the *Basic Research* is a status of opposition/merger of the *Specialization Basic Research* and/or *Inter-area Basic Research*. Because the Modernism has created a big difference between areas in the philosophy and specific sciences, and between specific sciences and philosophy as well. A historical mission of the Postmodernism is to remove that extreme difference. Nevertheless, a complete removal cannot be done between basic sciences and basic philosophical studies. Because a nature of complex systems has characteristics of being *open, soft, dim* rather than *closed, tough, bright* as the Modernism assumes. Systems of being *closed, tough, bright*, in reality, have been abstractions from reality, not from objective reality as of its meaning.

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The opposition/merger in the concept of *Basic Research* and *Dilemma* between perspectives on *Basic Research* can be understood and explained on basis of

some background paradigm of the philosophy and contemporary sciences like a complex thinking paradigm by Edgar Morin and unimportant - important paradigm by Tô Duy Hợp and partners^(*) □

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^(*) For further information, such as Tô Duy Hợp (2015), "Study of Thinking - An Introduction", *Social sciences information review*, No. 9: 10-17.