

RESEARCH ARTICLE

Virtuality And Virtualistics

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Abstract

The article states that one of the characteristics of the epistemological situation is that post-nonclassical sciences study extremely complex, changing hierarchical objects, that virtuality occupies an important place in such objects, and that virtuality is inherent in the forms of cognition.

KEY WORDS

Paradigm, post-nonclassical, conceptual, gnoseological process, epistemology, structure, virtuality, image, algorithm, model, immersiveness, hypothesis, interactivity.

INTRODUCTION

Today, as in all philosophical directions, serious paradigmatic changes are also taking place in epistemology (the theory of knowledge). The content and direction of such changes are greatly influenced by post-nonclassical sciences, including the emerging science of virtualistics. In the paradigmatic, conceptual, and methodological changes taking place, it is necessary to distinguish two gnoseological processes:

1. the formation of general philosophical post-nonclassical epistemology and the emergence of a new paradigmatic structure in it;
2. the identification and discussion of the epistemological problems of post-nonclassical sciences (in particular, virtualistics). Both processes are bringing about a new epistemological situation on the front of modern scientific thought.

At this point, there is a need to explain the essence of the concepts of paradigm, virtuality (virtualistics), and gnoseological processes.

What is a "paradigm"? When did this concept appear?

This concept was scientifically substantiated and introduced

into politics by the American Thomas Kuhn in the 1960s. According to him, the formation of a paradigm is regarded as the result of humanity's beginning to influence the material world (nature) in various ways and thereby mastering it. Google has devoted more than ten million pages to problems related to the "paradigm shift," and 18,400 books have taken this word combination as their subject.

In the Great Encyclopedic Dictionary, paradigm is defined as (Greek *paradigma* – sample, pattern). In another source, it is defined as "Paradigm (Latin) – image or pattern, algorithm, model," and so on...

Proceeding from the above, paradigm is accepted as "the way of accepting, by society as a whole, a model solution approved as exemplary (standard or non-standard) by many people regarding the model of the 'world' or one of its parts (branch, field of knowledge, way of life and activity)."

Accordingly, the paradigm of the individual may also be understood as the intellectual thinking involved in accepting a solution concerning the model advanced by a конкрет (specific) person on the basis of his or her own mentality, and it can be said both that it differs from the paradigm accepted

by society as a whole and that it does not differ. Even so, such an approach serves as a great impetus to understanding the world (events, phenomena, properties, etc.) on a scientific basis.

The science of virtualistics (virtuality) has a great influence on the positive effectiveness of the process in the paradigm model.

The date of the emergence of the science of virtualistics corresponds to 1986, when the article by N. Nosov and O. Genisaretsky, "Virtual States in Human-Operator Activity," was published [2]. N. Nosov distinguishes between two metavirtualistic concepts – constant reality and virtuality. Constant reality consists of phenomena that are always encountered in our experience and have become habitual. The opposite of this reality is virtual reality.

Virtuality, from the Latin *virtualis* – possible, means an impression, object, or state which does not exist in a real state, but may appear under certain conditions. This word comes from the Latin *vir* – man, and denoted a quality referring to men's physical strength, strong-willed behavior, and spiritual elevation.

In ancient Roman mythology, the name of the god was *Virtus*. In the 13th century, it passed from Old French into English. In English, it is called *virtual*, and after the emergence of computing technology this term began to be used.

In philosophy, "virtuality" was known in the 13th century and is associated with the name of Thomas Aquinas.

The concept of "virtuality" appeared in ancient Byzantine philosophy in the 4th century and expressed potency (possibility, essence, causes) and the negation of reality.

Virtual being makes it possible to visually see all images in the 360° sphere.

The meaning of virtual is possible, that is, a phenomenon that occurs or may occur under certain conditions.

The term virtual reality was coined by Jaron Loner (1970). It is an interactive technology that makes it possible to create real illusion on a computer.

Virtual reality is connected with such concepts as immersiveness and interactivity.

Immersiveness is the person's imagining himself or herself in virtual reality.

Interactivity is the user's ability to interact with objects in virtual reality in real time and influence them.

Types of virtual reality: passive, controllable, interactive.

Passive virtual reality is the observation of an autonomous graphic image with sound that is not controlled by a person.

Controllable virtual reality is a scenario offered to the user in a limited quantity, with the possibility of choosing image and sound.

Interactive virtual reality is the user's ability to control the virtual environment on the basis of the laws of the world created with the help of a special device capable of performing the tracking function.

Tracking is a device intended to provide the coordinates (x, y, z) of the location of a real object in a virtual environment and the angles (a, b, g) of its placement in space.

If we apply what has been said to the model of virtuality in the movement of thought, the visible part of knowledge is called exoteric knowledge, while hidden knowledge related to astrology and similar fields is called esoteric knowledge. If exoteric knowledge does not contradict the rules of science, esoteric knowledge may contradict such rules.

In general, the meaning of virtuality can briefly be defined as a real phenomenon that occurs or may occur under certain conditions, a state that gives rise to non-standard intellectual thinking. It is also appropriate to say that this state is directly related to the concept of paradox.

As is known, according to the criterion of the concept of "paradox" in physics, it is defined as follows: "A paradox is an idea that does not correspond to generally accepted views or scientific rules, and is also contrary to common sense (an unnatural phenomenon)."

As an example of these ideas, let us cite a life example related to Archimedes' law. It is known that in the past, in rural conditions, sour cream was churned in a churn to obtain butter, and even now this is practiced in some families. The obtained butter was rolled into a ball and placed in a container filled with cold spring water (at that time there were no refrigerators). If the cold water was not changed frequently, by noon the sunken ball of butter would float in the water of the same volume, which is a clear paradox. That is, Archimedes' law is violated, and it turns into a particular case of Pascal's law [3. 29–32].

For modern epistemology of virtuality, two important concepts have been developed: the object of practical activity – areteya; the object of theoretical research – virtual. In virtualistics, both concepts were combined, and the concept of “virtuality objects” was formed, and in science the concept of “virtualution” was developed, expressing a new type of object that reflects the gradual change and formation of virtual objects [4].

Nevertheless, virtualistic knowledge is still at the initial stage of formation. In this sense, the heuristic potential of virtualistics (heuristic methods and approaches) and its paradigmatic prospects (paradoxes) are great.

In life, in fact, every person has a unique creativity (creative potential). It is only that through someone’s tireless work, with his new views and new taste as a creative person, he is able, like Al-Farabi, to rise from the level of an ordinary garden guard to the level of a great scholar of his time and era, the “Second Teacher” of the East after Aristotle, and a genius, while another person deprived of creativity remains merely an ordinary garden guard. From this it is evident that genius requires from every person the creativity that ensures perfection and maturity. About this, the “Second Teacher” said, “A person, in order to be human and to attain human perfection ...”

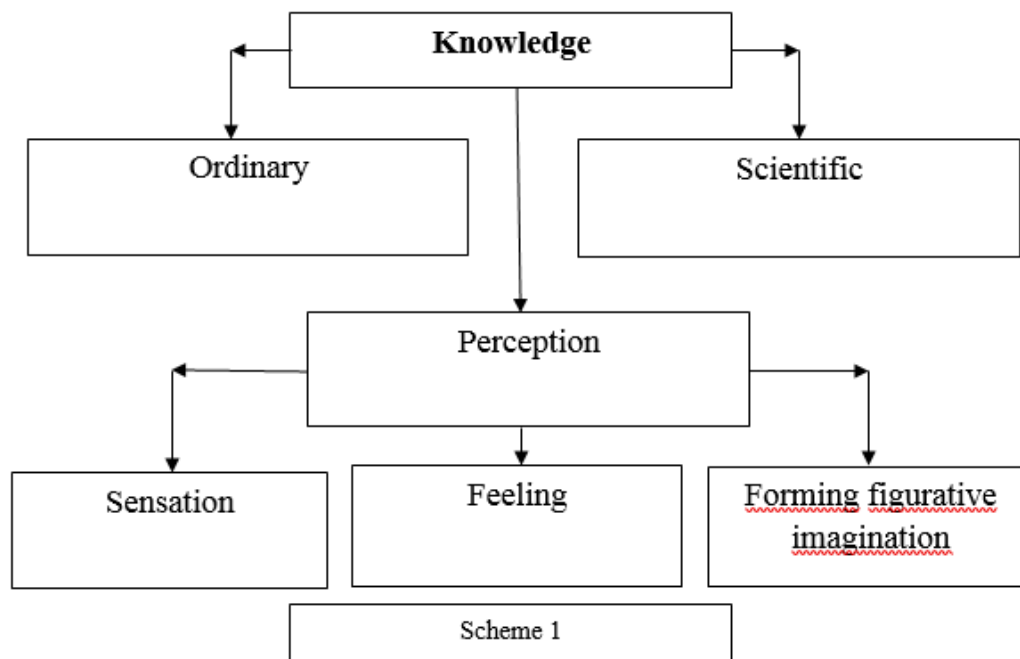
In the process of social development, a person moves from not knowing to knowing, from abstract knowledge to the

formation of perfect and precise knowledge. Humanity’s knowledge of the material world is relative; it constantly develops. Knowledge is accumulated through everyday observation and experience. In epistemology (the theory of knowledge), the doctrine that studies knowledge, perceptual (sensory), everyday life-based (common sense), and scientific forms of cognition are distinguished. Also, serious paradigmatic changes (processes) in epistemology give rise to new epistemological states on the front of modern scientific (intellectual) thought.

The essence of the concept of the gnoseological process in the movement of thought means establishing connections between concepts.

In English, this process is called serendipity, and it is said to mean: “One should not pass indifferently by some extraordinary event right beside oneself, saying ‘what is it to me,’ and think of it merely as indifferent involvement; on the contrary, one should look at it as containing a key that reveals the secrets of nature and solves complex creative problems (why is it so, what should be done?).”

If in this process a person creates something unusual and at the same time extremely important and useful, we consider this to be the product of virtual intellectual thinking. This, in turn, occurs through the person’s knowledge and perception of thought (Scheme 1).



If, in our everyday imagination, we believe in what something is, and if this belief does not contradict the events and phenomena (rules) to which we are accustomed, such perception is considered ordinary knowledge.

About the elevation of ordinarily known information in the gnoseological process to the level of virtual intellectual thinking, the English writer Graham Greene expresses the following remarkable idea: "Something that exists outside our consciousness and somewhere is like an anecdote heard in passing by attention or movement (manner, trajectory) — all of it boils in the cauldron of intellectual thinking and in many

cases turns into a new dish that even the cook himself could not have imagined" [1, p. 3].

In any scientific inquiry, there are two methods of finding the solution to the problem posed, and they are like the routes of movement of intellectual thinking (imagination), just like transport leaving the point of departure — from singularity to particularity (productivity), and from there to generality, and conversely, from generality to productivity, and from there to singularity.

By comparing these paths of creative activity with each other, they can be imagined in the following form.



This form is of important significance in developing the theory of the movement of thought in virtuality (scientific inquiry).

According to the philosophical foundations of the movement of a person's creative thinking in the virtuality under discussion, scientific thinking moves toward knowledge from singularity to productivity and from there toward generality. It is precisely this form that constitutes the subject of logic. This subject of logic does not pay attention to deviations on the path to knowing the truth, the winding roads leading to it or the possibility of proceeding along the straight path, as well as the "mental obstacles" in it and the "bridges" (steps) helping to cross them, or, in other words, the various contradictions on the above-mentioned path of scientific cognition do not interest it. That is, it recognizes the movement of cognitive thought aimed at ensuring the final result — the truth in its pure form.

In psychology, on the contrary, its subject consists in studying the winding nature of the path of thinking movement leading to the knowledge of truth and its causes, how obstacles on this path arise and how to overcome them, and in achieving

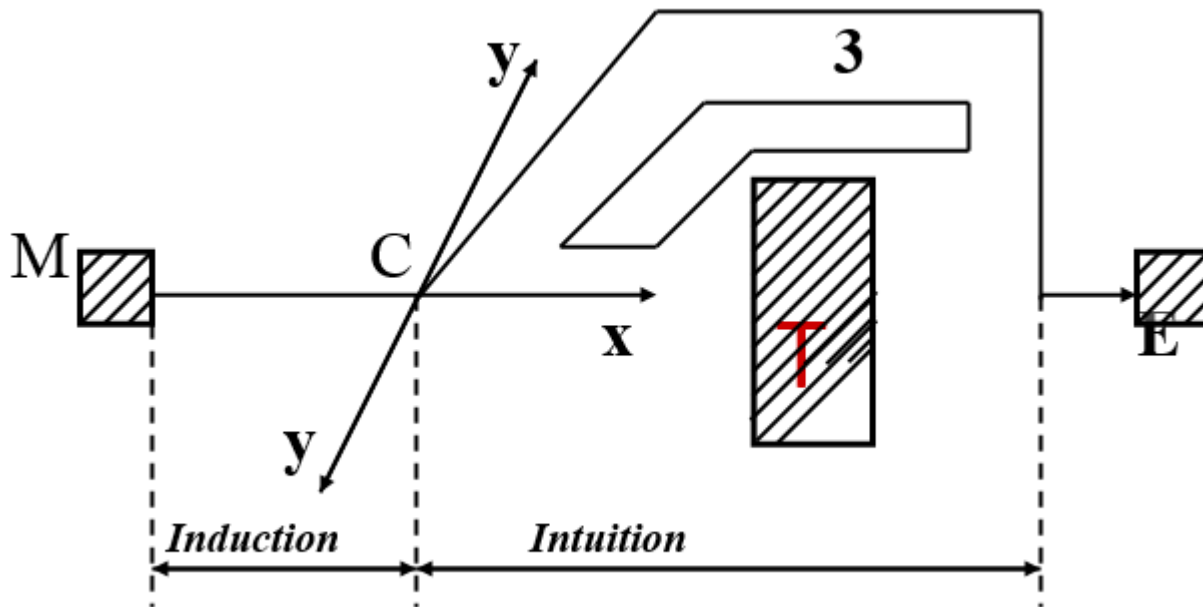
scientific truth by shorter and easier paths.

The essence of the relations between logic and psychology mentioned above requires a comprehensive deep analysis and study of the solution of problematic creative issues.

This solution consists of carrying out necessary observations, making calculations and experiments, dividing into facts, correctly taking facts into account, classifying them, comparing facts, generalizing, proving, drawing conclusions, and checking them.

The problem (M) and solution (E) in the model in the form embody various contradictions connected with the known and the unknown, that is, if a person knows something, it awakens a desire and aspiration to know what else he or she does not know and needs to know. It is precisely this contradiction that reveals the essence of the forward movement of a person's thinking in virtuality.

Proceeding from this, the virtuality model of the movement of thought in creativity can be imagined as follows (Scheme 2).



Scheme 2.

The cognitive-psychological model of the movement of thought in establishing scientific truth.

In the cognitive-psychological form of the model, we accept the following conventional symbols.

M – problem; X – direction of the movement of thought; U – external influence (knowledge) formed in the person’s imagination; S – the point where X and U intersect; T – obstacle; Z – staircase; E – solution.

As can be seen from the scheme, in the process of a person’s creativity, in finding the solution to a problem, he or she encounters a specific difficulty (obstacle T). This, in turn, requires overcoming that obstacle. To accomplish this, that is, to pass through the obstacle, external and internal knowledge are necessary, which we conventionally call an assisting staircase [3].

Here, X is the direction of the striving of the person’s thinking toward cognition, and in passing from “M” to “E” it must pass through the obstacle (T). This requires external knowledge. As a result of research, external knowledge is formed in the person’s thinking, and we denote this direction as (U). These external knowledges intersect X at point S, and from this point onward, the previously ineffective strivings come to an end and a staircase (Z) is formed that assists in crossing the obstacle (T). After that, the person’s thinking moves toward scientific truth (solution), crossing the obstacle by means of

the staircase, and the problem is solved.

As can be seen from the scheme, if the movement of the person’s thinking from “M” to “E” (accordingly, up to “S”) uses induction, then in the part after S it uses intuition.

From this, it can be concluded that, at the highest level of cognition, in order to establish scientific truth, human (personal) thinking activity moves together with induction and intuition, and in some cases (the lower level of cognition) through separate sensory perceptions, while sometimes at the higher stage of cognition (intellectual cognition).

According to the pedagogical foundations of Archimedes’ “Eureka,” the following final conclusion can be reached.

Archimedes discovered his law relating to hydrostatics (Archimedes’ law) through intuition. Because he did not enter the bath with special preparation and a special plan for the purpose of conducting an experiment on the essence of the phenomenon. Suddenly, by chance, through his inner feeling, he noticed the essence of the phenomenon and, out of joy, shouted “Eureka.” At this point, the question may arise whether the path leading a person to discoveries is ordinary accidental events. This is not correct; there are no discoveries accidental in the pure sense, and here it is more correct to use the word accident only in a conditional sense. Niels Finsen’s

"cat," Newton's "apple," and Archimedes' "bath" served merely as a simple impetus for them in finding the solution to the problem, or, in other words, merely helped them find the end of the thread, while they already possessed a strong reserve of knowledge before that.

CONCLUSION

In conclusion, one of the signs of the new epistemological situation is that, as we noted earlier, post-nonclassical sciences study extremely complex, changing hierarchical objects. In such objects, virtuality occupies an important place. At the same time, virtuality is also inherent in the forms of cognition. Therefore, virtuality in the subject and object should become the subject of research of post-nonclassical epistemology. Because a theory that generalizes and explains virtual phenomena and laws, that is, a unified, systematic theory of virtuality, has also not yet been fully developed. Sooner or later, such an important theory must certainly be created.

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