

## Methodology for improving students' cognitive activity in the process of teaching the physical image of the worldview

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### Abstract

The relevance of the study is based on the search for modern methods of improving the cognitive activity of students in the process of teaching the physical image of the worldview. This study aims to identify and reveal the physical world, the world of ideas and the boundary objects between these worlds, thus building a clear picture of the physical world itself, without contradictions and cumbersome theoretical constructions. The organisational approach, was chosen as the leading research method for this issue. Psychological diagnosis, observation and discussion methods were used in the training process. Recommendations for implementing the most efficient methodology for improving the students' cognitive activity in the process of teaching the physical aspects of the worldview were formed. The materials of the study are of practical value for specialities which study the physical potential of the worldview from its zero level to the closed Universe.

**Keywords:** Integrity, systems philosophy, self-improvement, self-determination, human development.

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## 1. Introduction

### 1.2. Theoretical Framework

There are countless modern methods for improving students' cognitive activity. The amount of information consumed during the learning process has a direct impact on the physical image of the worldview (Darling-Hammond *et al.*, 2020; Sapazhanov *et al.*, 2021). A personality is a person who actively develops and purposefully transforms nature, society and himself or herself, and who has a unique, dynamic correlation of spatial and temporal orientations, needs and volitional experiences, content orientations, levels of exploration and forms of implementation of activities. It ensures the freedom of self-determination in actions and a measure of responsibility for their consequences towards nature and people (Greene *et al.*, 2021).

Self-improvement as an integral part of the unity and diversity of the world leads to a transformation of the worldview. A worldview is a system of generalised views, perceptions and concepts of a person about the world, his or her attitudes to this world and to oneself. A worldview is formed in the process of living in society, upbringing, education, practical activities and self-reflection. It is a definite outlook on the world, mainly determining a person's life position (choices), principles of behaviour and value orientations (Makaiau, 2017; Bondarenko *et al.*, 2021). In science, the patterns of human development are considered in terms of biology, psychology, historical-spiritual and social approaches to further unify diverse views.

The pedagogical system is a complex, multi-level, dynamic information system. A variety of specific patterns are capable of changing the parameters of the order in the public worldview. The transformation of soul, spirit and body will create the conditions for the formation of a systemic worldview with its own system of concepts, principles and theories. By gaining wholeness, the individual is able to experience the love of being. He or she stoically endures the "challenges" of the environment with adequate, anticipatory "responses" (Bassachs *et al.*, 2020). He or she is generally aware of the trajectories of their development and describes the future of the surrounding reality in probabilistic terms.

Such enlightened wisdom is possible because of the sensory experiences one gains in the course of one's life if he or she is open and free. The accelerated pace of modernisation of the education system is inappropriate for the economies of many countries. A thinking person is the worst customer. A person who reads Shakespeare, listens to Mozart and understands the beauty of Van Gogh's work buys fewer appliances and services (Gruber *et al.*, 2021). Such people are more difficult to control, to manipulate. The incomes of the "masters of life" are falling, for which they seek to discourage culture and education.

### 1.2. Related Research

In studying the essence of the worldview as a method for improving students' cognitive activity, world scientists relied on the knowledge of Western philosophy of the 1920s. At that time, a special field of study – philosophical anthropology – was formed (Fletcher, 2020). It was a bold attempt for that time to combine the natural scientific and philosophical knowledge gained about human beings. The history of philosophical and anthropological thought is considered a chronicle of the growth of human self-knowledge (Martin *et al.*, 2016; Villasenor, 2017; Leng, 2020). A disadvantage of Western philosophical anthropology is the lack of a single coherent theory of the human concept (Muzi and Pace, 2022). By exploring the individual meaningful characteristics of a human being as a psychosomatic being, a rational animal, a natural being, a social animal, scientists have failed to come to a common ground of notions about the physical image of the worldview (Cunningham *et al.*, 2016; Belfield *et al.*, 2015; Anđić *et al.*, 2021a).

This was the starting point for the modern development and search for a common human concept in a comprehensive approach and systems methodology, which goes by the name – systems

philosophy (Darling-Hammond *et al.*, 2020). Systems philosophy focuses on understanding the multifaceted nature of the human being as a multidimensional and at the same time holistic entity. This is reflected in the subject's mind as a fusion of spiritual impulses, spiritual aspirations, rational desires, ways and forms of communicating with the world and the practical actions of the individual. All this diversity forms a common view on the world and is expressed in a systemic worldview (Greene *et al.*, 2021). Systems philosophy argues that common knowledge should be the unity of the manifold, and that in order for this knowledge to work in a specific life situation, the knowledge should coherently transfer into the manifold of the one (Bassachs *et al.*, 2020).

The practical experience gained is taken into account to improve students' cognitive activity using philosophical knowledge of the physical image of the worldview. The modern model of education, relying on the philosophical preconditions of the learning theory, which is based on the students' interaction with the world around them and themselves, is about openness to the new, the unknown and the future (Bedenlier *et al.*, 2020; Ortynskyy *et al.*, 2018). The learner, constantly acting in a situation of the unknown, learns to be open to other types and structures of life that may not be known at present but are in demand in the future (Li *et al.*, 2021). Such a training model based on the principles of systems philosophy will improve students' cognitive activity in teaching the physical image of the worldview.

### *1.3. Purpose of the Study*

The purpose of this article is to study the methodology for improving students' cognitive activity in the process of teaching the physical image of the worldview. This requires a new paradigm that focuses on the multifaceted development of the individual inseparable from the rest of the world, on his or her development with the rest of the world.

Research question: Should the education system be aimed at forming a modern person with a systematic and holistic outlook?

## **2. Materials and methods**

### *2.1. Research Model*

A number of methods were used in the study process. Theoretical methods (analysis of scientific literature in psychology and philosophy; synthesis of the obtained theoretical data; concretisation of objectives and methods of the research; generalisation of theories of the students' cognitive activity improvement; cross-section of the theoretical data of scientists from all over the world by analogy method; having modelled the objectives, tasks and relevance of the study the next stage of the worldview physical image topic was initiated). The methodology is based on the systems philosophy principles, where all of the above objects of study are in relationship, interaction and inter-transition. This is the methodological basis for the research in this study. The path of knowledge acquisition from the general philosophical to a multitude of practical actions and cognitive tasks. The human being occupies the centre of this system. As one who moves from knowing oneself as one with projection in the multiple, so does knowing the multiple through understanding oneself as one.

### *2.2. Participants*

The experimental base for the study was secondary school No. 164 in Almaty. The students of the 11th grade in the Philosophy Department aged between 18 and 20.

### *2.3. Data Collection Tools*

At the diagnostic study on the improvement of students' cognitive activity, the observation method and a survey were used, in the course of which students left general information about themselves (name, age, occupation); theoretically modelled methodology for the improvement of students' cognitive activity in the process of teaching the physical image of the worldview was implemented in practice.

#### 2.4. Data Collection Process

Having studied the experience of Western and Kazakh educational organisations, regulatory and teaching-learning documentation of educational organisations, a pedagogical observation was carried out in the process of introducing the methodology of systems philosophy in the course of teaching the physical image of the worldview. Students were provided with a unified theoretical and methodological basis for understanding and learning about physical objects, objects of nature and society.

#### 2.5. Data Analysis

The third stage of the empirical research of this study involved drawing conclusions from the results of the research. The research managers noted the success in mastering the learning material through remembering the physical image of the worldview. The students themselves pointed out that projecting knowledge onto themselves (knowing the physical image of the worldview through a multiple understanding of the one) makes it easier to assimilate the material being studied. In order to introduce the systematic methodology suggested by the authors, a set of recommendations has been drawn up which require a transformation of the education system itself.

### 3. Results

Systems philosophy as a separate field was put forward in the middle of the 20th century by Western scientists. From the Greek "systema" – wholeness, integrity, with an order of parts and properties as a whole, where the worldview is based on the idea of integrity, unity, harmonious interconnection and interaction of parts as a whole, as well as the multiplicity of world objects (Darling-Hammond *et al.*, 2020). This area of philosophical science developed during the perestroika period, when Marxism as a doctrine was weakened. This period is marked by a variety of authorial theories that focus on the human being as a multidimensional phenomenon. This is why the methodology investigated in this study was based on the principles of systems philosophy.

The study assumes that a person's understanding of the physical image of the worldview will lead to a higher degree of awareness. Such Western scholars as A. Makaiau *et al.* (2017) studied the theory on physical image of worldview by L. Parafilo (Sartini and Ahimsa-Putra, 2017), who argued that all physical objects in the Universe have structural definiteness. The theory describes ideas about structures, physical and analytical models of the following objects: elementary charge carriers, neutrinos and photons, nucleons, elementary particles, atomic nuclei, atoms, gases, liquids and solids, the Earth, the Sun, a galaxy and a black hole. The theory of the physical world presented in this study provides a consistent representation of objects and interactions for any hierarchical level of the Universe.

Nothing is more elemental and inseparable in this world than a potential and a pair of currents; potential as the embodiment of the idea of rest (for when one feels fulfilled in some area of one's life, there is nothing more permanent than a state of flux); the magnetic bias current as the embodiment of the idea of rotational motion (having a certain potential, one is able to develop); the electric bias current as the embodiment of the idea of forward motion (only certain actions can lead to human development). Postulating and implementing the fundamental and inseparable unity of the Spiritual and Physical components of the Universe provides a rational removal of the intractability of genesis essence problems. Thus, the forming objects of the real physical world represented in the theory turned out to be rest and motion, which are the categories of the spiritual world.

Absolute rest corresponds to absolutely nothing, which has an inherent limiting potential. In this sense, the potential for the nothing corresponds to the limiting creative capacity. It is its realisation that provides the dynamic, quasi-stationary state of the Universe. The physical world is continually being born everywhere in the forms of neutrinos and photons and just as continually dying by the same objects in the processes of dissipation and acts of incarnation, according to S.

Sartini and H. Sh. Ahimsa-Putra (2017). Understanding this process enables a better understanding of the essence of the human being. As the relationship between the self-image and the actual circumstances of the individual's life enables the individual to change his or her behaviour and perform self-education.

Considering this, the research in this study has attempted to modernise the education system through a systematic methodology. J.A. Greene et al. (2019) mention in their manual the words of V. Frankl: "A worldview is not transmitted or assimilated in a ready-made form, but is formed by the individual through his theoretical thinking and reflection". A worldview integrates a unified system of needs and motives, consciously set goals and intentions, and the individual is therefore able to act independently, unaffected by the external environment. Thus, the students who took part in the research – were engaged in learning about themselves, starting with the elementary particles of the physical image of the Universe. Such knowledge enables one to take a certain internal position and self-determine oneself.

The 11th grade students noted that they have become more aware of how the Universe works, and they have integrated the essence concepts of people's attitudes and spirituality. A worldview includes, on the one hand, a system of generalised ideas about the world and oneself in it, but, on the other hand, it represents one's attitude towards the objective reality surrounding it (Greene *et al.*, 2021). The students have increased their level of cognitive activity, realising that everything in the world happens not because of them, but for them. They have realised that the world is not a dangerous place and they create all the events in life on their own. This authentic position in life is given to highly effective individuals who are not afraid to take responsibility for their lives, acting as the author of their life position.

As a result of the empirical study, the main new formation turned out to be an interest. The students noted the formation of an interest in life, in learning and in themselves. After all, interest is the highest form of human emotion expression. And the indicator of the correctness of the decisions made is how one feels. "Rest" and "nothingness" are the two starting points for the creation of everything in the Universe. Thus, when an individual is in a state of rest, the inner potential triggers a flow that stimulates him or her into action, in this state one can create something out of nothing.

This idea is reflected in the studies of L. Parafilo (2017), which were used in the studies of S. Sartini and H. Sh. Ahimsa-Putra (2017). Incarnation is a spiritual act, a type of active boundary between a spiritual essence and a physical phenomenon of the same object. This concept is widely used in everyday practice in relation to the realisation of intentions. The idea then emerges in the mind of an individual or a group of like-minded people, enabling its further materialisation. The idea of motion does not apply to the organic spiritual world of human beings, because regardless of it, mechanical motion existed in the physical world and will continue to do so as long as this world exists. Thus, it can be seen that development is the main paradigm for any sphere of human activity.

In the 21st century, the crisis has intensified in most countries, manifesting itself in the devaluation and primitivisation of education, the dehumanisation of curricula, the widespread use of simulators, the introduction of foreign cultural principles of life that break down the minds and behaviour of students (Stukalenko *et al.*, 2016). All that the current education system needs are safety. Expert evaluation of educational programmes for the formation of a holistic consciousness of a working person with a systematic, ecological and spiritually-moral worldview; professionally prepared; practically capable; able to work in teams on the principles of unity and solve strategic tasks to restore the balance of society and nature. Therefore, society needs a person who is intelligent, spiritually-moral, balanced, creative as a being, capable of entering into a reunion with the physical image of the worldview. This is possible through the adoption of a biophile spiritual paradigm, which involves the formation of a holistic consciousness.

Education should provide the foundation of culture, which enables the realisation of the essential powers of the individual through a system of social experience transmission, a mechanism

of social inheritance (Tenerife *et al.*, 2022; Zhussupbekova *et al.*, 2018). All this is possible only in the environment where one can express one's creativity. This is because creativity is only possible with the freedom permitted. The highest form of self-realisation can only be the creative, formative result of an activity. A creative act is always an act of stepping out of oneself, beyond one's being. It's always about sharing with the world, and the Universe is always favourable here. It is creativity, for without the development of the new and the creator, life cannot exist.

#### 4. Discussion

L. Darling-Hammond *et al.* (2020) cite the words of the great Goethe, in which worldview is understood as the knowing and creating self of the individual with its spiritual world. According to him, a human being combines both the material and the spiritual of this world, endowing with the feelings the diversity of the world while being a part of it. In the past, perceptions of the world were of a fragmented nature. Each doctrine aimed to interpret the worldview in a homogeneous way (consisting of homogeneous fragments). A heterogeneous worldview, on the other hand, emerges at the moment when the subject becomes aware of the relationship between objects and phenomena. The highest form of a heterogeneous worldview is the perception of the world – a holistic system including itself in the components of nature. The integration of homogeneous components into a heterogeneous whole can be greatly facilitated by an education system that includes non-institutional and institutional forms (Darling-Hammond *et al.*, 2020).

Objects and phenomena that one encounters on one's life journey, people and their actions, are stored in one's memory in a patchwork of memories. Such selective attention accompanies a person throughout his or her life's journey. Unfortunately, this model of teaching will not be efficient without the formation of links between phenomena, and without a foundation in scientific knowledge. Also, selective study of academic subjects will lead to a lack of a holistic heterogeneous worldview. All of the above points to the first recommendation in this study: learning should be holistic. Senior grammar schools in modern Finland have chosen to teach about phenomena in preference to subject-based learning. The phenomena occurring in nature and society are analysed from the perspective of various sciences (Belfield *et al.*, 2015).

The United Nations Educational, Scientific and Cultural Organisation has called this model of education the "Finnish Educational Miracle". While the existing education system in most countries has been recognised as a crisis, failing to meet the main purpose of education: to plant the sensible, the good, the eternal. In line with this, the modelling of the methodology for improving the students' cognitive activity of this study was carried out from the perspective of exploring their feelings, experiences through similar objects and phenomena in the Universe. The application of the Finnish system of analysis of natural phenomena in the educational system of Kazakhstan can be demonstrated on the example of elementary physical phenomena. Thus, in an organic sense, the concept of physical motion is characterised by changes in the position of the body in space as a result of linear movement and rotation.

The absence of such changes corresponds to a state of rest. These essential opposites are to be attributed to the spiritual component of the world. According to modern views, there is no such thing as a bodily object "motion" in the physical world, just as there is no such thing as an object "rest". Nevertheless, the physical objectification of this pair of fundamental concepts proves to be possible within the extremely complete electromagnetic theory of the universe, which is inseparable from the most important concepts and provisions of the Spiritual World (Theobald, 2021). Using a comprehensive approach, the connection between the spiritual and the physical component is realised through the procedure of embodying specific ideas: the idea of rest is embodied in a potential; the idea of motion in the form of currents (electric and magnetic). This is also the case with the human nature of decision-making.

While at rest, the subject is filled with the resource to take action. No action can be taken without a push (stored potential), a charge of energy which induces movement. By explaining to

students the importance of the key action in physics lessons in an exemplary way, the teacher develops children's awareness as a component of worldview. A worldview is a means of a person's attitude towards the world, of evaluating it in terms of truth and falsehood, good and evil, justice and injustice (Gruber *et al.*, 2021; Anđić *et al.*, 2021b).

As previously mentioned in the study – the formation of a worldview is only possible through creativity, and creativity manifests itself in a state of freedom. For many millions of years human beings have wondered how to achieve freedom, to free themselves from a semi-animal existence. The achievement of freedom is the greatest good for the individual, a necessary condition for progress, its sense and purpose. In most cases, when a person gains their freedom, they have to lose something important at that point of their life. So, for example, Adam and Eve were released from their comfortable and serene unfreedom by expelling them from paradise. Once on the path to freedom, they had to carry the heavy burden of the constant situation of choice that is the prerogative of free life. As a thinking, active being a person constantly strives for unrestricted freedom, for the maximum expression of one's vital energy and creativity. Thus, in order to survive, human beings had to harmonise their relationship with the multifaceted reality around them (Theobald, 2021). And in order to live, to experience true joy, to be the author of one's life, one must understand what the world in which one has to live is like. To know what a person is, and therefore what his or her place in the world is (or can or should be), as well as what he or she can and should do. Since primitive times, the population of a particular area has tried to create favourable living conditions. What was the need people were trying to satisfy back then? The science of biology can answer this question. The human brain is built in such a way that, when exposed to new conditions, it assesses the level of danger to the subject. It scans the space like a metal detector. This skill is not consciously recognised, as it has been formed during evolution and is triggered unconsciously. Understanding this feature of human nature allows one to accept the shyness of a new member of the team, the difference in degree and rate of adaptation period. In psychology, this phenomenon is called basic trust in the world. If a person has had reinforcing negative experiences with the world around them during their life, it will be extremely difficult to trust certain processes, phenomena and events. Thus, a comprehensive and holistic understanding of the self is the main methodology for improving students' cognitive activity in the process of teaching the physical image of the worldview.

It is generally accepted that the physical world is assigned a dominant role in the modern knowledge system. While the spiritual component is given a less essential, service-oriented, subordinate role. Its traditional spheres turned out to be: the arts, the psyche, social relations and religion. Since mythology is historically the first form of a worldview as such, one can use it as an example to identify the main features inherent in any worldview. In primitive times, the Greco-Roman times, right up to the emergence of science and philosophy, among others, people tried to explain events and phenomena in nature through mythology. Thus, during these periods, polytheism, superstitions and traditions emerged. The peoples believed in sacrifice, incantations and that it was possible to cast a curse. This example vividly demonstrates the variability of worldviews. Worldview is a consistency of the world in a knowledge system; a system of norms, rules of human behaviour; a person's subjective conception of the world; a definition of the place and role, the meaning of human life. Hence, a worldview as a system of ideas about the world and a system of behavioural stereotypes becomes a necessary condition for the existence of a human community. Behind this is a fundamental human problem – the problem of freedom: to what extent the active person and the cognising person are free (Gruber *et al.*, 2021). It is difficult enough for one person to create a system of representations about the world. Personal life experiences are often extremely limited by such factors as the individual's time in life and the framework of social productive activities. A worldview, in this case, is the result of the collective creativity of people. This is not only about knowledge on the world, but a stereotype of behaviour, an attitude towards reality, that is compulsory for an overwhelming number of members of a given community. Therefore, a worldview system is developed by a group for its own interests, which do not coincide with the interests of individuals, and is imposed on everyone (Yerkebulan *et al.*, 2022).

The world is open to creative development, not its evolution. The creative age is learned through an active creative effort that results in the discovery of creativity. The doctrine of creative development presupposes freedom as the basis of necessity and identity as the basis of all being. Orthodox systems are against creativity. They do not want to recognise any new issue, they are suspicious, hostile to creativity, searches and struggles of the spirit. This proves that the implementation of students' creativity in education requires a special system of measures and conditions to eliminate the negative attitudes of educational systems towards the innovation and creative processes organised within them. The human psyche is organised in such a way that chaos, the disordered nature of an object not only cannot be cognised, but is generally poorly perceived even on a sensory level. And in order to take another step towards a spiritual and practical exploration of the world, it needs to be well-organised. Thus, Chaos gives way to Order in human perceptions of surrounding reality. An order is a system, an interconnection, a cause-and-effect relationship (Tenerife *et al.*, 2022).

Success in the pedagogical system, unlike the results of the exact sciences, cannot be repeated even twice. As the formation of a worldview is affected by the context, the environment, the personality of the teacher, the learner undergoes changes. Therefore, the system needs to develop, firstly, by solving internal contradictions and, secondly, by giving the right "answers" to the "challenges" of the environment. The system should be managed through a control subsystem with mandatory feedback (analysis-planning-organisation-control-correction), using only qualitative information for the management to prevent or level out entropy. The education system should be capable of further self-organisation in the absence of non-linearity, non-equilibrium, openness of the system. In this case, the interaction of the system is possible if there are quality elements capable of providing a resource to the system, so that the dialogue "learner-education" occurs as a viable organism. It is important that the education process does not take place against the background of a general crisis of the rest of the educational system components. This is possible by restoring the integrity of the pedagogical system, human knowledge, and a person's worldview. One of the priority tasks for teachers in this situation is to inhibit this development scenario, to filter innovations and even to actively resist, actively immunologically react to the aforementioned diseases of the modern educational system.

A system of this format places excessive demands on the image of the teacher, who needs to be universal. He or she should not only be endowed with a holistic outlook, but also educated on the multidimensional side of multifaceted phenomena and objects. All this is possible through the transmission of the syncretism of knowledge about the physical image of nature, humans, to teach how to link all philosophical and worldview meanings and values into one. It is currently possible to combine different approaches, styles of thinking in a harmonious way. For instance, synergetics, the systems approach, and dialectics can claim to be a general methodology for investigating the surrounding world, productively integrating subjects that have fragmented a single knowledge into unrelated and often contradictory parts (Tenerife *et al.*, 2022). The basic principle of the worldview is the unity of the world. It makes it possible to disseminate knowledge from one area and to compose representations in another one, thanks to the kinship of connections in the Universe. A human being knew that the world was one. And this enabled them to transfer to nature what they observed and learned from the collective. L. Leng (2020) calls it the most significant principle of human enlightenment in relation to Nature. Transphysical knowledge of nature can enlighten a person with a breakthrough of cosmic consciousness, a sense of universal harmony. "There is no greater happiness on the Earth than the full disclosure of inner vision, hearing, profound memory".

## 5. Conclusions

In the search for methods of improving the students' cognitive activity, the authors of this study came to the conclusion that the process of teaching the physical image of the worldview should be systematic and holistic. In this regard, the education system should be directed towards the formation of a modern person with a systemic and holistic worldview and a creatively shaped



mind. As mentioned above in the study, the implementation of such a methodology is possible under conditions of freedom. A person who is trapped by limits, by their fears, by limiting beliefs is prone to high levels of anxiety. In its turn, it inhibits the work of the limbic system of the brain and narrows the perception of the world. Such a learner seeks to see the reasons for everything that happens in the outside world, without thinking that it is possible to look within oneself. A self-centred, human orientation leads to a stalemate in development, giving rise to a hedonistic consumer society. Therefore, the education system should result in a harmonious personality, which is capable of self-improvement, self-complication, the desire to bring chaos into order. It is possible to carry out this process by being open to new knowledge, by being moral and faithful, mentally and spiritually potential, by being attuned to one's own aspirations.

The limitations of the study are that the connection between spiritual and physical components, which is realized through the procedure of implementing specific ideas, was not comprehensively investigated. Future research is planned to fill this gap.

## 6. Recommendations

The suggestions for future research as a result of this research are as follows:

– Studying a world experience of the development of systems philosophy for improving students' cognitive activity.

– Developing the methodological system of formation of students' self-determination and self-improvement.

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