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Simulation of Professional Creative Self-development of Person of High School Educational Process-based on Polilateral Approach

Abstract: The polilateral approach justified in the article as a methodological basis for the study of the creative essence of professional creative self-development of educational process in high school and formulated the guiding principles of polilateral approach, Constructed a conceptual generic chain of investigated phenomenon: “self-development” → “creative self-development of personality” → “professional creative self-development of personality” → “professional creative self-development of educational process in high school”. Developed a spatial model of professional creative self-development of educational process in high school, taking into account the characteristics of their interaction, described the possibility of application of the model.

Keywords: self-development, professional creative self-development, the subjects of the educational process in high school, polilateral approach, modeling, spatial model.

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The development of education systems in Russia today is characterized by increased attention to the inner human potential, suggesting the creation of educational environment conducive to the disclosure of the natural data and formation mechanism of creative self-development of cognitive, emotional, physical and spiritual abilities as the most effective and humane way to a person's education. However, this process of reorientation of teaching to the ideas of self-education and self-development creates significant difficulties theoretical and methodological

understanding of pedagogical and psychological concepts, which are changing their value in accordance with the new educational values.

In particular, during considering the integral concept of “professional and creative self-development of educational process in high school” (PCSD), which is a new high-quality unit of analysis in comparison with its included concepts, possible quantity of interpretation increases in proportion of the complexity of the phenomenon, In our opinion, within the confines of the only methodology construction-impossible adequately describe such a complex phenomenon as a self-developing personality and characteristics of the process.

A.N. Poddiakov assume that the basic requirement for any approach or research method in any field is its ability to actualize, to allocate exactly considered property and at the same time ignore, neutralize or even actively suppress the effects of all the other properties that are not the subject of study, Thus, any of the existing approaches, speaking only of the methodological basis of the study, has its own advantages, but also fundamentally insuperable restrictions. Actualizing the need for a “systematic methodology of modern educational research”, N.V. Bordovskaya emphasizes that researchers in determining the methodological guidelines in the process of scientific research counterproductive to the development of science is not only to select the “only correct” approach, but also to focus on a number of approaches, if they are not linked by general system and logic [1].

Pedagogical studies often tend to exaggerate just one of the characteristics of a process that not only does not meet of reality, but also impoverishes the educational reality and the possibility of its study and development. Indeed, the modern psychological and pedagogical

knowledge characterized by poly conceptuality, and not only in form but also in content, which organically involves complementarity of pedagogical trends and concepts [2]. In particular, analytical and synthetic study of the central concept - the professional creative self-development of subjects of educational process in high school - confirmed the need for a plurilateral approach to the construction of this integral concept : the usual “struggle” of opposites was not enough, necessary to implement of multiparadigmatic trend (N.V. Bordovskaya) in development of pedagogical science and pedagogical practice, This has led us to offer poly lateral approach (from c, Poly - many, many + lat, Lateris - face side: a multi-faceted, versatile) as a special methodological research, that defines a set of principles for study concept construction that designed to more fully disclose, describe and implement investigated concept [3].

Poly lateral approach, specifying the general methodology of the study in accordance with the specifics of the studied concepts, uses the positive elements of key methodological approaches and allow us to get new facts and generalizations related with the solution of asined problem. It proposes to consider the concept-widely, with different (often opposing) positions in conjunction of all points of view. Let's formulate the principles poly lateral approach, that define methods of obtaining fundamental knowledge, by reflecting the specificity of the process PCSD:

– multi-polarization principle: in modeling and study of pedagogical phenomena, in particular, the process of PCSD, the polarization of opinion - the most convenient way to comprehensive characterization of the studied phenomenon. Creating a network of dual position contributes to the “funnel of contradictions”, in

which effectively working the dialectical law of unity and struggle of opposites for polar pairs of points of view;

– integral subsidiarity principle: mechanism of integrating the various parties is extremely important during polarization of positions, their interdependence and complementarity, continuous determination of the meaning of PCSD through each of the possible poles of opinion, the neutralization of the negative things of some points of view using the positive ideas of dual positions, on the one hand and mutual reinforcement of the positive side, the other side. This principle seeks to unite the opposition into a coherent whole, overcoming the inevitable limitations of each approach in isolation;

– the principle of creating a new quality provides emergence of a new qualitative vision of problem can not be reduced to the original point of view as a result of studying the various sides of the PCSD process;

– the structural integrity principle: the construction and study of the network card of the concept, considering the concept of the unity of its organization, in a holistic interaction of its constituent elements, which are self-developing sub-systems;

– the principle of multi-dimensional system: the basis of multi-dimensional PCSD process, is a multi-dimensional personality traits, as well as multi-dimensional situations, the implications of activity subject: the way of creativity, characteristics of professional or educational activity, communication, subject-subject interaction, self-direction;

– the principle of multiple determination and development: multi-variant and choice supercedes rigid cause-effect relations, changes in self-developing system is provided by the dialectic of

alternative opportunities, which allows on the practice of individual bifurcation path PCSD;

– the principle of optimal resultant associated with the creation of a hierarchical structure of personality traits and abilities, leading the release of areas for further professional and creative self-development, the most effective for the subject at a given point of the field of self-development system.

During construction a methodological foundation of the research of professionally and creative self-development problem of these principles means that the different methodological approaches to the study of the process of PCSD can fully interact, not only does not contradict, but also complementing, extending to each other, as a matter of allocating research different sides of the phenomenon. To polylateral approach organically involved in the methodological framework of pedagogical science, it must be justified at all levels of methodological knowledge: philosophy, general scientific, particularly in science and technology (E.G. Yudin – I.V. Blauberger). We mean by this consistent its interaction with existing approaches and define the specifics of the implementation of the study of the concept of «professional and creative self-development of the individual / entity».

It is noteworthy that almost all philosophical doctrine, acting philosophical methodological basis of the human sciences, there are features of polylateral approach. They are manifested most clearly in the dialectic, particularly in the ancient: «There is a state of the tensions between opposing inside which cerned may appear the phenomenon itself is not deducible member or element of a continuous causal connection» [4, p. 38]. It is important here is that polylateral approach not only considers the phenomenon from the opposite of the positions, smoothing

out inconsistencies and highlighting of them positive and useful, but is able to «cast» a fundamentally new position underivable available directly from : «...there are phenomena that can not in principle be derivable member or the final link in a continuous chain of conditioning, They occur in the crater, surrounded by tensions of contradictions (my italics – I.S.), Inside - a flash or not flashes. And if you break out - then holistically» [4, p. 39]. Gradually philosophy comes to understand that we live in a pluralistic, multifaceted world.

The systems approach, reflecting the general relationship and interdependence of phenomena and processes at the level of general scientific methodology, acts thus as a base of development of polylateral approach. It helps to identify integrative invariant system properties and quality characteristics of the system that are not found in the constituent element (holistic approach). In this case, the behavior of systems as diverse and specific, that raises the question of inability of their exhaustive characteristics within a single formal theory (V.V. Vasyilkova), R. Flud and M. Jackson offer group different systemological methods, in a sort of a «system of systems methodology» and depending on the problem situation to choose the most appropriate ones [5]. Polylateral approach in this case offer us do not choose one, even the most appropriate approach in a given situation, and to consider the concept in volume, with different (often opposing) positions in conjunction with all points of view.

The synergistic approach, complementing the system approach, focuses on the genesis, mechanisms and dynamics of self-organizing complex systems of different nature. PCSD is a process of self-developing system, therefore is subject to the laws and principles of synergy. It is noteworthy that the concept of «synergy» was formed

from the Greek «joint action», «cooperation», so it can be viewed as a theory of joint action (G. Haken), which is not consistent for polylateral approach. Bifurcation mechanisms of synergy, as well as polylateral approach provides a tendency to change the developmental system: the first - with the dialectic of the choice of two or more alternatives, the second - by the synthesis of alternatives. They are two sides of the same coin. This interaction allows to overcome the limitations of the system approach, the integrity of the student, but did not pay due attention to the uniquely creative,

Many approaches the level of specific scientific methodology also noncontradictively interact with a polilateral approach.

Dualism is typical for educational anthropology also as for the philosophical, but pronounced polylateral idea consisting in multilateral system using the data of all the human sciences. Emphasis for us in the person-activity approach is the emphasis on the uniqueness of the individual, self-development of its instincts and creativity, establish relevant pedagogical conditions, organizing professional and meaningful activities as a basis, the means and conditions of an important professional creative self-development, which undoubtedly actualizes the laws of polylateral interaction between the individual and the business.

Polysubject (dialogic) approach is not only accord names: on the basis of it's ideas can be argued that the condition for self-development and self-realization is a constructive dialogue with another person, Thus, the process of PCSD will be more effective in terms of interaction of students and teachers, which requires a constant correlation of their goals of self-development with the relevant objectives of the other subjects of the educational process. At the sametime, the

efficiency of the PCSD will be directly proportional to the level of professional and pedagogical culture of the teacher, which, being directly incorporated into a real professional space, contributes to the formation and development of the multifunctional educational environment by providing special funds for teacher regulation of inter-subject interaction, It actualizes polylateral interaction and cultural studies approaches.

To comprehend the nature of the process professional and creative self-development of the teacher and the student as the subjects of professional work and educational activity, respectively, are important to us acmeological ideas and contextual approaches. In this case, we consider a subject of the educational process in high school is not as perfect image, but as a constant movement to it via the ratio of the actual characteristics of the professional creative self-development with the optimal model of self-organization to meet professional requirements and capabilities (for teachers) and the characteristics of the future trade (for students).

On the basis of individual creativity is possible and advisable to develop and implement individual programs vocational and creative self-development for student (which gives you access to more flexible models of school organization, purchasing for students personal and meaningful character), and for teachers (which creates favorable conditions for professional growth and provide adequate interaction with related students processes). This approach in conjunction with the synergetic is a methodological framework for the development of individual trajectories in the bifurcation of the model PCSD and building technology professional creative self-development.

Of particular importance in the study of pedagogical concepts and phenomena are the polar

opposite point of view: «opposites converge», the various by content theories and methods are somewhat united and inter-penetrate, from different sides enriching the test concept. One aspect of the application of the idea of polylaterality namely polarization angles for the study - in general coincide with the content of the ambivalent approach. In our terminology, it can be called a bilateral (from Lat, Bi,.. - double (x),,..), but we emphasize that the names are semantically different: we do not mean the fact that we consider only the two opposing positions, and the fact that the view of complex object of study is usually polarized, up to antithesis, and, in the absence of dual position (opposite but complementary) it is useful to make it artificial. However, very often removal of research carried out by the opposite poles by absolute truth during leveling at the other (the so-called inversion), which leads to loss of positive ideas of opposite concept and impossibility of their synthesis. The bilateral approach integrates and reconciles opposites (turning them into contradictions), over the opposition, often opening up new, unexpected edge concepts that can not be reduced to the polar points of view. As a result, for a full description and definition of the concept of multifaceted analysis of several pairs of dual points of view, and each has a well-reasoned position of truth, Polylateral approach aims to combine these parts into a single unit.

At the fourth level methodology - Technology - polylateral approach manifests itself as follows: research methodology is a set of complementary theoretical and empirical methods that are subject of methodological principles discussed above in conjunction with the greatest certainty able to explore and characterize this multifaceted and multi-purpose facility, which is the process of professional creative self-education subjects at the university.

Thus, polylateral approach represents a set of principles and consequent organizational and pedagogical methods of activity, allowing to consider PCSD as an open and self-developing system with dual complementary positions define the dialectic of alternative changes to the system, to study the various facets of the process of PCSD, to form a holistic concept of unity, its hierarchical structure and dynamics of functional interaction determine the multiplicity and variability of situations manifestations of activity of subjects, identify the leading trend professional creative self, the most effective for subjects at a given point of the field of self-development system.

There by polylateral approach to the study of professional creative self-development of educational process in higher education, having the basis at all levels of the methodology consistently included in the existing system of scientific knowledge and methodological basis and determines integral part of the process using the current approaches to the unity of their positive possibilities,

On the basis of categorical oppositions, which naturally polylateral approach, we define a number of conceptual studies of the phenomenon of PCSD: «self-development» → «creative self-development of personality» → «professional and creative self-development of personality» → «professional and creative self-development of educational process in high school».

Specificity of self-organizing systems based on a synergistic approach allows us to solve the question of the degree of influence of internal and external factors in the process of self-development. However, if the synergy of classical key and the basic concept is the self-organization of the system, then reasonable to living systems (individual, society...) such term, in our view, will be self-

knowledge, which is built on the ability to self-organize, Thus, the process of self-development implies an ability on the basis of self-knowledge to gain experience of self- consciously and creatively get it and functional use, including, and in professional activity.

Self-knowledge we identify as the first relatively independent functional unit of self-development, Self-knowledge - is a process of self understanding, your potential and actual properties, personality and mental abilities, relationships with others, behavioral characteristics, etc. (V.G.Maralov). Self-organization is the second functional unit of self-identity, self-knowledge built on the self understanding mechanisms, Self-organization includes an analytical assessment of the situation, the ability to problem statement, planning decisions, the ability to create the conditions necessary for their implementation, to ensure the realization of itself directly, the ability to deliberate choice, forecasting results; possession of various methods and techniques of self-correction and self-control, endurance and stamina as a condition and means self-organization, etc

Self-organization in terms of the educational environment necessarily presupposes own pedagogical activity of the individual, self-directed, with the aim of not just existing disclosure essential powers, abilities and qualities, but also the acquisition and development of new for a deeper personal and professional self-satisfaction.

To do this, we highlight the following relatively independent function block mechanisms of self-development, inextricably linked with the previous ones - self-education, which includes the processes of self-learning and self-training.

We understand self-education as the process of conscious self-development and improvement

of essential personality and potential strength: physical, mental, creative, moral qualities, intellectual and social skills in order to «finish» yourself to the ideal character as a whole person, capable of self-realization (O.S. Gazman).

A special aspect of the study is a professional self-realization as the goal, the condition and the result of a focused professional creative self-development of the subject of the educational process at the university. In a broad sense, self-realization of the individual - is the process of implementation possibilities of the person in accordance with the will of the individual, rather than spontaneously (N.L. Kulik), or the disclosure of human nature, the implementation of the essential powers of man (O.S. Gazman).

Thus, self-realization is the fourth functional unit of self-development, acting as a dialectic goal of self-development. Describing the content and mechanisms of self-development process, we make the following definition of it. Self-development of the individual - is a conscious process of personal formation for effective self-realization on the basis of internally meaningful aspirations and external influences. A variety of mechanisms of self-development are connected in the four-stage functional blocks: self-knowledge, self-organizing, self-education and self-realization.

Special interest in our study presents the creativeness as a pedagogical phenomenon. Creativity – is a separate process and is not one of the immutable mechanisms of self-development. This is possible on a reproductive level too, with mild creative abilities. However, the creative direction of activity may provide additional opportunities of self-development.

The role of creativity in the university educational environment is not limited to the use of

heuristic methods in teaching, but emphasizes the creative process of the personality. Thus, we view creativity as the most important way of effective self-development determining its creative essence. This allows us to assert the existence of an integral concept of «creative personal self-development» (CPS), which is obtained not by simple addition of its constituent terms, and represents an entirely new concept.

CPS is a certain structural and procedural characteristic of personality which can be represented as a process of improving the efficiency of processes «self», and the level and quality of a particular person (such as the capacity for creative self-development). Such interpretation allows us to introduce the concept of space-sky creative self-development, which is located in a multidimensional space of personal qualities, values and skills [3, 6, 7].

A clear interpretation of the c space will build an analogy with the mathematical space: applicable to different people, CPS is understood as the set of elements of the structure imposed on the person with this set of characteristics of the defined terms of content as the degree of severity of the differences of elements based on objective criteria of creative self-development.

Then we can interpret the present system as a pedagogical space in which roles of its points play elements and the distances between them - the differences between the elements. For clarity, we can confine ourselves to the usual image of a three-dimensional coordinate system, meaning an enclosure defining a spatial concepts, which are also multi-dimensional formations. For example, each coordinate includes such personal-surface factors such as motivation, values and personality, etc., without which the process of creative self-development is unthinkable, but that can not be independent coordinates. So,

for the exhaustive CPC space characteristics you need to install its basis - the concepts, the functional interaction of which will determine the essence of the creative self-development and unambiguously describe the level and condition of SPC at a certain severity of the basic concepts.

We have already established two basic concepts of three-dimensional CPS space: an axis of “self-development”, defining mechanisms for implementing this process by individual, and the axis of “creativity”, that characterizes a specific way of intensifying the process of self-development. To determine the third basic direction it is necessary to apply the principle of subsidiarity poly lateral integrated approach: the notion of what may be a dual for creativity and thus to determine the effectiveness of the process of self-development in his absence? In our opinion, these conditions satisfies the concept of “intelligence”.

Indeed, in the educational and professional work intelligent (rational, logical) and creative (heuristic, intuitive) methods and techniques

are often opposed and complementing each other at the same time, defining a holistic development of personality by combining logic and imagination in it. Besides, the need of intellectual component caused by the real situation in the educational process at the university: teaching and professional activities of students and professional pedagogical activity of teachers is primarily based on intellectual activity, suggesting a high degree of mental development of the individuals.

Thus, in terms of self-development best opportunities have those persons of the educational process who has better intelligence, wich understood in this context as “how cognitive activity of complex systems, capable for learning, focused of information processing and self-regulation” [as quoted by 2 nd, p. 184]. Thus, the intellectual component is no less meaningful way of process of creative self-development.

Thus, the CPS space defined by the following coordinate system (Fig. 1):

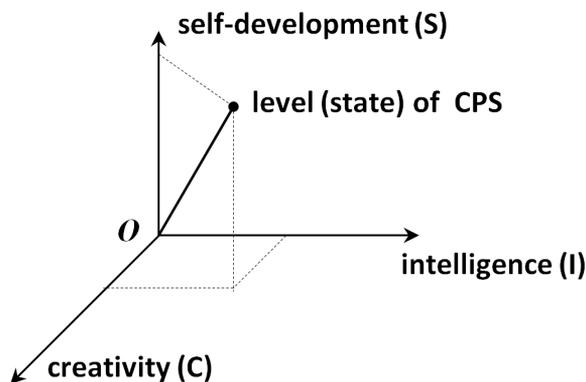


Figure 1. The mathematical interpretation of space creative self-development

Level (state) of creative personal self-development (CPS) is expressed as a function (dependence) of the process of self-development (S) of the two “variables” (ways to improve the

process) - creativity (C) and intelligence (I): $CPS = S(C, I)$. Nonlinearity of creative self-development process, characterized by nonlinear functional dependence of $S(C, I)$ in accordance

with the principles polyateral approach, in particular, the principle of structural integrity and the principle of creating a new quality, confirms the integral nature of the concept of “creative self-development of personality”. Thus, creative self-development of personality is the integrative creative process of conscious and purposeful formation of personality based on the interaction internally meaningful and active-creative perceived external factors.

The process of creative self-development as a form of personal existence at a certain stage of its development, is fundamentally creating and affects all the internal sphere of man, manifesting itself in all forms of personality: in activity, communication, behavior, etc. - which in turn contributes to the formation of further motivation of creative self-development. When analyzing the characteristics of this process for the subjects of the educational process in high school, we'll assume his professional focus (Fig. 2).

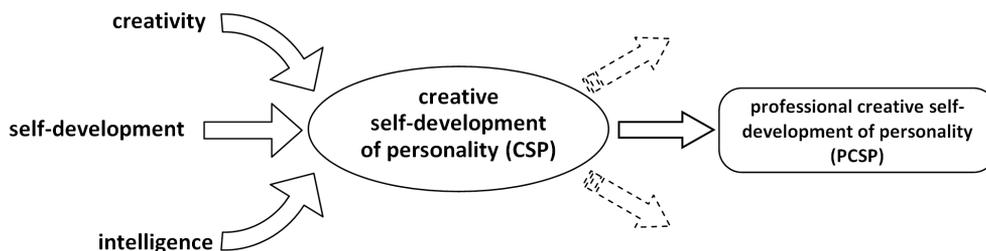


Figure 2. Reflecting generic chain of “self-development” → “Creative self-development” → “professional creative self-development”

Then the professional creative self-development of personality (PCSP) of teacher (student) in high school – is a creative self-development of his personality in the educational environment of the university, providing dialectical creative self-realization in professional (educational and professional) activity.

PCSP is carried out by mechanisms of self-discovery, self-organization, self-education as the pursuit of professional and creative self-realization, using creativity and intelligence as a way to intensify this process. We hold the view that the establishment of a professional - one of the aspects of personality development (A.K. Markov). Moreover, professional development is inseparable from the individual - the basis of both is the principle of self -development, determining the ability of personality to turn their own livelihoods in the object of practical transformation (L.M. Mitin).

That is, the structural space of professional creative self-development is a subspace of creative self-development, so the functional dependence $PCSP = S(C, I)$ remains the same, but specific to PCSP, which is a professional orientation of each of the basic processes. For example, self-actualization is seen primarily in the context of teachers professional self-determination, self-improvement, self-education, self-teaching, using these processes as a means of self-realization [8].

Professional self-realization - is the result of the searching «yourself in the profession,» the assertion of professional image, personal style in professional activities, their own professional role, the image of «I», the disclosure and implementation of their creative potential, determination and achievement of professional prospects, establishing new professional goals, etc., the following operations become dialectical turn of professional

ascent. When considering the nature of the PCSS process, for us the social role of personality in itself is not significant, and its support - the subject, freely and consciously choosing a role and taking responsibility for its execution.

We focus on the important and creative nature of the subject's activity, its inclusion in the magnetization professional activity, possession of self-regulation techniques, the quest for self-realization and artistic creativity, constant disposition for self-development and self-renewal in the process of communication and interaction (A.K.Markova).

It is important that in the implementation of the process of professional self-development subject can enhance or neutralize (ie change, if necessary) applied to it external influences. If in relation to the teacher as a subject of the educational process in high school it is taken for granted, for the student as the subject it is necessary that at first he came on a certain level of awareness and responsibility. Usually these moments of «ripening» for different students do not match, which causes serious difficulties subject-subject interaction between students and teachers in practice.

As a result, professional and creative self-development of subjects (PCSS) of the educational process in high school -is the unity process of professional creative self-development of teacher and student, carried out in a constructive interaction. Within the context of pedagogical interaction it is regarded as a process of joint activities of teachers and students, and due mediated educational activities at the university, established values, contributing to the formation of the student's personality and perfection personality of the teacher. «It is not only trained goes to a new level, but also the teacher, as it is impossible to develop a student without developing yourself. Development of student conjugate involves self-development of teacher «[9, p.6].

For a full study of PCSS it is equally important to identify both general regularities of professional

creative self-development, as well as the specific features of each of the component processes. From this it follows that the model PCSP of students and teachers, although built in the same space of the professional creative self-development, should have fundamental differences.

In particular, the model PCSP of student should take into account promising creative self-realization in the future professional activity (and, the model must be to a certain extent universal, not limited to the specifics of a particular profession), model PCSP university teachers, by contrast, should be focused on particular ongoing professional and educational activities (but also not confined to a particular specialty of the teacher).

As a theoretical model of some phenomena it is meant, as is known, its approximate description given for some formal language, reflecting studying side effects, so that the study model of it can provide new knowledge. That is the model - is a copy of the real object of study, it reproduces the most important characteristics and properties, principles of organization and functioning of acting in relation to determining the results. The absence in the model of «non-essential» elements is no less important than the presence in it «essential» (N.D Nyurberg). The models perform the following epistemological functions: representational, translational, explanatory, predictive.

The very notion of space of professional creative self-development suggests the possibility of constructing a mathematical model of the process based on polilateral approach. Mathematical models as said formal language used mathematical apparatus, characterized by regularity, capacity, and convenience describe the severity of processing - the most important features that determine the efficiency of the use of mathematical models in modern humanities researches. Factual description of pedagogical processes in the language of mathematics with constitutes the essence of mathematical modeling, which,

reflecting the dialectic relationship between pedagogy and mathematics, has the following logic: the construction of pedagogical construct - mathematical model - pedagogical interpretation of the results.

For practical purposes, it is imperative that the mathematical description language is useful for the further implementation of calculation of functions of model - construction of qualitative tools, estimating complex and subtle pedagogical phenomena. So, the corresponding model of PCSD, obeying a common methodological basis of research, should be built in a multidimensional space of professional creative self-development, combining subspace of PCSD of students and teachers, intersecting the axis of «self-development».

Thus, the axis of «self-development» (S) will act as a guide axis model, the other axis - subspace will express particular personalities teachers (PT) and students (PS), reflecting the pro-

cess of PCSP each of the subjects [3]. From the standpoint of principle of structural integrity of polilateral approach is important that the interaction of educational process acts as an integrating factor by which the combination occurs parts (processes of PCSD) in a certain type of integrity (PCSS), knowledge of which is related to, but different from knowledge of the individual parts.

Keeping in mind isomorphism of the three-dimensional space and open areas we can use the spherical model developed by us [10] for a more visual representation of the interactions of processes PCSP subjects of the educational process in high school, applying the so-called spherical coordinates.

Thus continuity changes in spherical coordinates emphasizes continuing process of PCSS and openness of sphere implies the possibility of external influences and the ability to internal changes in the structure of PCSD (Fig. 3).

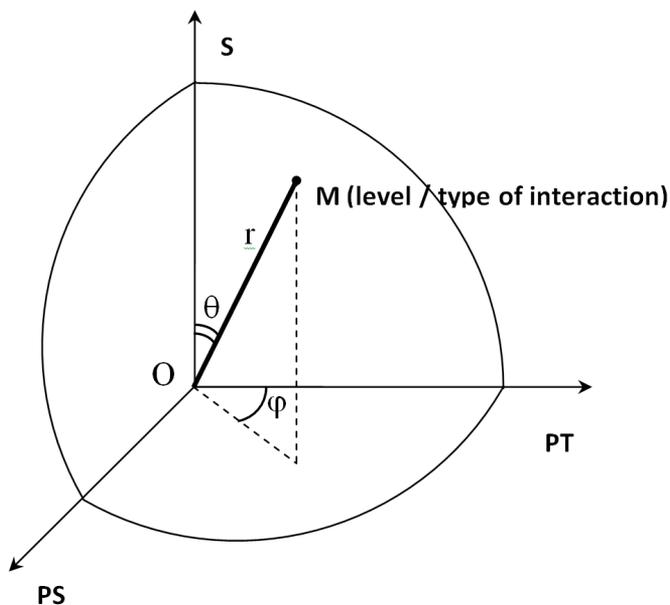


Figure 3. Spatial dynamic model of PCSS (in spherical coordinates)

The interaction processes of PCSP subjects defining essence of the process of PCSD, in the designated space will be characterized by three parameters:

- the length of the vector r interaction (this parameter determines the level of intensity of interaction);
- angle φ between the axis of the OP and the plane passing through the axis C and the point M (this parameter defines student-oriented feature of the process PCSD, defining measure of the «rotation» of the personality of the teacher to the interests and characteristics of students);
- angle θ , which forms a vector interaction with the positive direction of the self-development (accounting degree of subjects features of professional creative self-development of each other).

Thus, each point M (some of PCSD as the interaction processes of PCSP subjects) correspond to certain coordinates r , φ , θ , and vice versa: $PCSS=f(r, j, q)$.

Such an interpretation of PCSD process allows us to characterize how different types of interaction of subjects (depending on the measure of an angular rotation) analyzed their shortcomings and potential for intensification of PCSS and levels of interaction, levels of PCSS process (depending on the coordinate r).

We consider in detail the pedagogical sense of spherical coordinates in the process of professional creative self-development of subjects.

Angle φ has **personality-oriented load**, determining, as we noted, particularly the field of interaction of the teacher and students as subjects of the educational process: as the last opinions about teachers, its total image in their eyes, and importance for the teacher of the motives and interests of students, measure excluding them

and their individual personality characteristics of the organization of the joint process, the professional creative self-development.

The angle φ defines the so-called spatial distance (contact) between the teacher and students. For small values of the angle φ , teacher focused solely on their own goals and interests. As the angle φ increases the density of contact between teacher and students, the number of optimal relations and mutually enriching influences (the projection of the interaction of «turns» to the axis of the OS).

That is, the angle φ is a measure of the rotation of the role modus of the teacher to the subjectness (V.A. Petrovsky).

But the interaction processes of PCSP is bilateral, thus obeying the principle of subsidiarity poly lateral integrated approach, it is necessary to consider not only the changes that occur with students by means of the influence of the personality of the teacher, but the force of impact on the students themselves PCSP teacher.

In particular, the excessive focus on the views of students (especially dangerous in the case of a low level of awareness and responsibility the last in the process of learning) is possible «dilution» of the individuality of teacher, global domination of secondary students interests to the detriment of the educational objectives.

These states correspond to the desire of angle φ to the extreme position (when the projection of the interaction approaches to the axis OS). Teachers walking «on occasion» of students tend to choose style «flirting», trying to imagine it as democratic. Thus, the angle φ is **not** directly proportional to the person-centered orientation of the process PCSS: you must choose a «middle ground» with regard to educational circumstances and individual characteristics of

PCSD of teacher and students. For each teacher the choice of distance of communication with students, of course, is different.

Similarly, the angle θ is a measure of the subjects accounting processes of PCSP each other in the implementation of the interaction and thus measure of the implementation of mechanisms of professional creative self-development.

Plane $OP \cap S$ and $S \cap OS$ determine the compliance with professional and personal qualities and abilities of the teacher and the student and the requirements for them and occupational characteristics of a process PCSD (relevant to the stages of the process and mechanisms of transition from stage to stage).

Certain plane can detect and take into account the individual capabilities of teachers and students of the university and determine on this basis subjectively optimal way of professional creative self.

In addition, as noted above, the mathematical interpretation of the process of PCSD in the form spatial model has many pedagogical implementations, namely allows you to:

- Show alternatives of PCSD, in particular, to determine the specificity of the bifurcation choice and probabilistic ways of professional creative self-development, which will allow each subject to visualize and implement individual (subjective-optimal) bifurcation trajectory of PCSD, focusing on the structure of the dominant motives, technological training, personal abilities and professional goals (future professional) activity [12];
- To propose a typology of personality of students and scheme of individual styles of teaching activities of university teachers in the context of professional and creative self-development;

- Visualize and characterize the features of interaction and communication of students and teachers in the educational process of high school, suggest a typology of interaction of subjects of the educational process at the university in the context of PCSD, highlighting the key types of interaction based on the following three features: subjectivity position in relation to each other, the presence of a perceived general PCSD goals (mutual development of necessary personal and professional qualities) relating to the identity and interests of each other;

- To characterize the levels of process of PCSD, using the stages of basic processes to formulate a transition condition of personality from level to level;

- Identify criterial assessment base of level of professional creative self-developmrent of the student and the teacher.

Consideration of the essence of the concept of interaction of subjects of the educational process at the university in the context of PCSD based on poly lateral approach allows us to formulate the dual statement: interaction between teachers and students is a factor in the intensification and simultaneously is a measure of the efficiency of the process of PCSD and back: the most important way of forming effective interaction - business processes complementary to PCSD based on joint professional and creative activities.

In this case, the efficiency of PCSD as a result of the influence of the interaction factor of subjects increased, if:

- it is formed a positive attitude in the interacting parties on a single process of PCSD, they realize common goals and processes of PCSP and find personal meaning in them;

- there is a joint planning, organization and reflection process of PCSD of pedagogically expedient distribution of roles and responsibilities of teachers and students in this process;
- it is created a situation of free choice of individual professional creative ways of self-development, types and methods of implementation of the relevant process;
- the individual style of the teacher creates the necessary conditions for self-development of students, promotes professional and creative self-realization and self-expression of students in the PCSD and back;
- in the course of PCSD it is necessarily valid positive feedback than in-not only as a teacher of students received information about yourself and your professional and educational activities, but also as an aid to self-development of the missing qualities.

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