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SYNERGETIC AND INNOVATIVE APPROACHES IN EDUCATION

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Abstract*.A significant number of research results in different fields of knowledge are correlated by researchers with synergetics. The problems, content, research methods and results related to synergetics are characterized by ambiguous assessments and uncertainty. At the same time, synergetics as a scientific area of research is in demand by society. The organic need of modern science for generalizing interdisciplinary research continues to stimulate the further development of synergetics and its emergence to a new level of integration interactions. Synergetics operates today as a category of scientific knowledge. The context of synergetics makes it possible for scientists of different specializations to interact fruitfully in the language of system understanding and the search for new solutions. The education system is one of the social subsystems of society.*
The modern socio-cultural space in which the education system functions is unusually rich in diverse content. Numerous social systems, traditionally existing and newly emerged, interact with each other, enter into certain relationships, and are in a state of constant activity. The combination of traditions and innovations is the main socio-cultural norm of relations between the old and the new, excluding their opposition and affirming their complementarity.
The purpose *of the article is to study synergetics and innovations in modern education.*
Methods *- analysis, synthesis, systematization, induction and deduction, generalization.*
The results *of the article will consist in the analysis and systematization of theoretical literature and practical experience of teachers.*
Novelty *is due to insufficient development of the chosen topic.*
A research gap *is noted in the insufficient development of the topic of synergetics in education.*
Theoretical contribution *consists in summarizing scientific information on a given topic*
Key words: *synergetics, synergetic approach, pedagogy, education, multivariance, pedagogical technologies, interaction, cooperation.*

INTRODUCTION. The aim of the study is to analyze the issues of introducing synergetic pedagogical technologies into the learning process. Some problems in adapting the synergetic method with traditional dialectics are critically evaluated.

The formation of a post-industrial information society is based on knowledge, when the need for innovation puts the importance of fundamental and applied science on the same level. Therefore, the training of highly qualified specialists, firstly, should be associated with priority areas for the development of industry and the economy, and secondly, at all levels of education.

RESEARCH METHOD. The main research method is the analysis of modern and synergetic approaches to education. Changes leading to the emergence of new socially significant landmarks are part of the development of modern society. The process of socio-cultural, political and economic modernization of the country is associated with the introduction of innovative models in the education system. Thus, the education system solves the problem of gradual reorganization of the process in order to produce and implement innovations.

Based on the needs of the modern world, the educational environment should change in such a way as to contribute to the education of a person who can think critically, make decisions independently, predicting their possible consequences, a person who is able to work in a team, characterized by mobility, dynamism, constructiveness, ready for intercultural interaction.

RESULT & DISCUSSION. The change in scientific paradigms at the turn of the 20th and 21st centuries was that the cybernetic paradigm that dominated the sciences in the second half of the 20th century was replaced by a synergetic paradigm.

Synergetics is translated as «energy of joint action» (from the Greek «syn» - «co-», «jointly» and «ergos» - «action»), an interdisciplinary direction created by Professor of the University of Stuttgart Herman Haken, which studies systems consisting of many subsystems of various nature (electrons, atoms, molecules, cells,

neurons, people, vehicles, etc.), and revealing how the interaction of such subsystems leads to the emergence of spatial, temporal or space-time structures on a macroscopic scale [1].

Synergetics is a science that studies the basic laws of self-organization of complex systems. It includes such areas as nonlinear dynamics, determinism, chaos, fractals, catastrophes, bifurcations, waves, field effects, etc. The growing popularity of synergetics in our time is explained by the fact that it is becoming a language of interdisciplinary communication, understandable for specialists in the field of mathematics, physics, chemists, biologists, psychologists, etc., although everyone understands synergetic models in their own way [2].

Synergetics as a model of self-organization brings new possibilities of strategies in thinking, giving non-traditional approaches to many problems. In synergetics, a more general and broader problem is posed of studying the emergence of self-organization itself as it occurs in natural, natural processes. At first, the objects behave absolutely independently and there is no mutual ordering in motion. This initial state is often characterized by the concept of «chaos» and «disorder». Then, at certain critical values of the energy or information coming from outside, an interaction occurs between objects and they begin to participate in a coordinated, deterministic movement [3].

Disorder is replaced by order, a certain stable structure emerges from chaos, that is, a permanent relationship is established between the components, which from the former autonomous objects turn into elements of an ordered system.

Researchers and specialists from various branches of knowledge saw in synergetics a new direction in science, which allows turning chaos into order, bringing systems to a qualitatively new level of development.

Thus, synergetics is the science of complex systems interacting with the external environment, in which the collective action of heterogeneous elements is observed, leading to the development of the system through a number of relatively stable states [4].

Synergetics turned out to be such a direction in science, which immediately became in demand in almost various fields of activity. In synergetics, specialists from different scientific fields have discovered many new opportunities.

The very history of the creation of the science of synergetics is evidence of a powerful integration process that led at the end of the 20th century to a synergetic process - the creation of a universal worldview science with great potential in many branches of knowledge and activity [5].

On the basis of G. Haken'ssynergetics in the last quarter of the 20th century, synergetic schools of various directions began to emerge. Electronic synergetics, biological synergetics, chemical synergetics, physical synergetics, economic synergetics emerged. System-synergetic approach, a new scientific paradigm used to solve such problems that could not be solved by other, more classical methods.

Pedagogy and the organization of the educational process did not stand aside either. In this branch of knowledge and activity, instead of thinking, which is based on a deterministic approach, more and more examples have appeared that explain phenomena from the standpoint of synergetics.

The change in the paradigm of thinking led to the rejection of linear models in favor of non-linear, self-organizing ones [6].

All this leads to the formation of a paradigm of pedagogical synergetics, a synergistic approach to the process of teaching and educational activities.

In the light of the synergistic approach, a person is not just an element of the system that develops along with it, but a force capable of overcoming crises, streamlining the system, and stabilizing it.

The synergetic approach to education is based on the use of the properties of non-linearity, openness of pedagogical systems, their ability to adapt to environmental conditions on the basis of self-organization.

In real educational systems, with this approach, the leading link is innovative mechanisms and means of education and training, which must be systemic, comprehensive, coordinated in space and time, consistent, multidimensional and continuous [7].

Paradigms, new scientific concepts, innovative technologies play the role of fluctuations (fluctuations) and, before they are implemented in pedagogy, they go through a number of stages of self-organization and, then, introduction into pedagogical systems.

The conceptual and methodological novelty of the ideas of self-organization is associated with the recognition of the ability of various systems for self-organization, self-development, not only due to the influx of energy, information from outside, but primarily through the use of their internal capabilities[8].

Based on this, a new synergistic concept can contribute to a deep knowledge of such complex systems as the education system.

We consider innovations in their most important dimension, primarily as a substantial core of development. Their implementation is a multifaceted and ambiguous process of change. Thus, the creation of new models of teacher training takes place at the intersection of conflicting areas of unification and diversification; the aspiration of pedagogical education towards innovation proceeds against the background of the expanding standardization of the «industry» of higher education; The problem of the correlation of national, regional and global in the creation of training programs for future teachers is now more relevant than ever [9].

From the end of the 20th century innovative processes in the education of Western countries are largely characterized by two main directions: intensification and restructuring. Each of them goes through a series of stages, which are accompanied by a restructuring of knowledge. This is not a linear process, and the chronology here is relative. Much more important is the essential content of each of the stages of intensification and restructuring, which has found its logical continuation in the current changes.

As part of the first wave - in the 1970s. - the emphasis was placed on the search and dissemination of the best educational practice. The theory of this period prioritizes the stages of initiation and development of innovations, rather than their implementation. The lack of proper scientific support for the implementation of innovations, especially those carried out at the school level, leads to numerous cases of their failure. The positive results of this stage were manifested in the widespread use of computer training, focus on the formation of creative and critical thinking of students [10].

Innovative approaches to learning can be divided into two main types, which correspond to the metaphors of the educational process mentioned above. Modernization innovations that modernize the educational process, aimed at achieving guaranteed results within its traditional reproductive orientation. The technological approach to learning underlying them is aimed primarily at imparting knowledge to students and forming ways of acting according to the model, focused on highly effective reproductive education. Innovation-transformations that transform the traditional educational process, aimed at ensuring its research nature, organizing search educational and cognitive activities. An appropriate exploratory approach to learning presupposes, first of all, the formation in students of the experience of independent search for new knowledge, their application in new conditions, the formation of experience in creative activity in combination with the development of value orientations [11].

Since in many cases the innovative product did not reach the educational institutions for which it was intended, due to problems at the stage of introducing innovations, there has been a second wave of intensification. It is based on attempts to understand what constitutes the successful implementation of innovation: dimensions, factors, strategies, favorable conditions, and on the basis of this knowledge - building a model of the change process.

Change is beginning to be seen as a multidimensional phenomenon, including the need to modify attitudes, perceptions, behaviors, relationships that people enter into when implementing innovations. A significant number of case studies are emerging. They are mainly applied. Within their framework, the problems that arise during the introduction of a change are studied and specific recommendations are made [12].

The range of directions in which the development of the upbringing and educational system can proceed is determined by the nature of this system, which undergoes evolution in the process of its development. In other words, this spectrum is determined by a bifurcation - a branching of the old quality into a finite set of well-defined potentially new qualities. A chain of bifurcations can not only lead a self-organizing system away from its initial state, but also return it to this state. For a specific educational system interacting with a specific environment, there is its own attractor - the limiting state, having reached which, the system can no longer return to any of its previous states[13].

The most important task of education is to organize the transfer of cultural heritage from generation to generation. It is clear that synergetics, which claims to be a new scientific paradigm of thinking, could not bypass this sphere of human activity. With regard to the topic under consideration, two aspects of it can be noted: synergetics in education and synergetics of education.

The first is more traditional and concerns the introduction of relevant disciplines into university education (for example, such as «Nonlinear Dynamics», «Self-Organization in Nature and Society», «Chaotic Behavior of Dynamic Systems», etc.), holding various training seminars, conferences. Finally, this is the publication of popular science literature, the organization of educational television programs, and so on [15].

The second side should include teaching methods and techniques based on the concepts of synergetics, the creation of a fundamentally new learning environment, new approaches to the management of educational structures.

With the first side, everything is quite obvious: work in this direction is being carried out quite actively. At the same time, there is no need to radically revise the very concept of education, since the task is completely solved within the framework of the traditional educational paradigm. This is not the case with the other side - here one cannot do without such a cardinal revision [16].

Since synergetics studies open systems, in which the fundamental point is the interaction and exchange of energy and information between objects and subsystems, and the pedagogical process is a specially organized interaction between the teacher and the student, then the use of the key concepts of synergetics in education from a general theoretical position is quite logical. Such key provisions of synergetics are the concepts: self-organization, synergy, non-linearity and chaos. Let us show how, using these provisions, we can describe a new concept of education, which we will call the synergetic paradigm.

Self-organization in relation to education will mean self-education. In self-education, the emphasis is shifted from the transfer (transmission) of knowledge and skills from teacher to student to learning how to independently search for and assimilate the necessary information, interpreting this information in one's own context.

The second key word synergy (coordinated interaction) in the aspect of education acquires the features of a dialogue or even a «polylogue», and not a monologue, as in the traditional scientific and technological paradigm of education. In this case, the educational environment is formed not according to the «object-subject» type, but according to the «subject-subject» type. In such an environment, the teacher does not broadcast some samples of «objective» knowledge or ready-made truths as in the traditional paradigm, but together with the student develops the forms of educational activity, its content and evaluation criteria. The latter is very important, since in such a learning environment the space of assessment criteria is largely moved to the area of personal relationships between the teacher and the student, who are in a state of cooperation and even co-creation [17].

Nonlinearity in mathematical terms means, in particular, the existence of more than one solution to the problem under the same initial conditions, as well as the presence of various kinds of branches (bifurcations) in the space of solutions. In a broader sense, this concept includes multivariance, the alternative choice of paths for the evolution of complex systems. In the pedagogical process, nonlinearity should manifest itself in the form of a joint search for a solution to a problem by a teacher and a student, a search, the result of which cannot be unambiguously predicted, since creative activity is fundamentally non-deterministic [18].

Finally, chaos is the most complex of the concepts of synergetics. Chaos in the new paradigm sets the teacher the task of transforming the unorganized and spontaneous space of aspirations and opportunities of the student into a creative field in which the new is seen in the already studied and familiar, and, conversely, the features of the already known and familiar are manifested in the new. Let us note that chaos should not be overcome, let alone expelled from education, since with such expulsion, unorganized creative energy itself will be expelled to a large extent, and creativity risks turning into a formal operation with ready-made clichés and categories. Chaos should be transformed into a space of joint creativity of a teacher and a student, in which they, reaping the fruits of their labors, travel through common mental spaces (figure 1).

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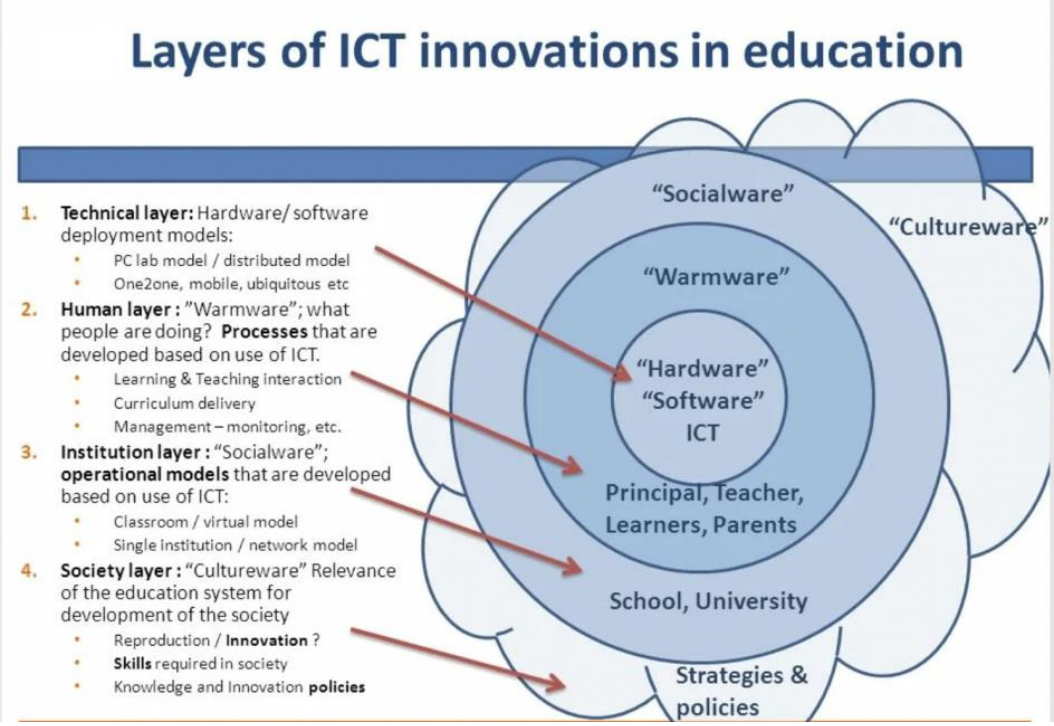

Figure 1 - Comparison of two educational environments by features

Thus, in the theoretical aspect, the features of the new synergetic paradigm of education emerge quite clearly. The situation with the development of specific methods of such education is not so obvious: the literature on this subject is much scarcer. This is understandable: after all, we are talking, in fact, about a radical change in one of the most conservative stereotypes of thinking.

At the first stage of the implementation of this program, methods will be appropriate, in which, along with the presence of new elements in the spirit of the principles of synergetics, there will also be traditional, well-proven methods that do not conflict with the ideas of synergetics. One example of such an approach is the method of teaching using associations (the Zigzag method [5]) described in the Synergetic Paradigm collection. In this technology, the key conceptual cluster is assimilated through individual associations, which are somehow connected with its central logical core [19].

Another example, which, in the opinion of the authors, has a great future, is the technology that is being developed within the framework of the international project «Development of critical thinking through reading and writing» (RKCHP). An international association has been established to implement this project. The Association publishes a magazine, holds training seminars and conferences in various countries of the world, including Russia.

The basis of this technology is the reproduction in the classroom of a three-phase cycle, the stages of which are called, respectively, «challenge», «understanding» and «reflection» [20]. At the first phase of the call, the following tasks are set: to arouse interest in the topic under discussion, to activate the student in such a way that he is prepared to critically perceive new information. At this stage, the student remembers what he knows about the issue under study, systematizes this information, makes assumptions and asks questions that he would like to receive answers.

The main tasks of the second stage of comprehension are: maintaining the interest and inertia of the movement created at the first stage, as well as the efforts of students to track their own understanding and gradually move from knowledge of the «old» to the «new». The student reads (listens) the text using the active reading methods proposed by the teacher, takes notes as he comprehends new information.

The reflection stage is often overlooked in the teaching process, although it is no less important than the others. At this stage, the teacher returns students to the original assumptions in order to make changes and additions. Students should try to express new information in their own words (in their own context), for which the teacher offers them creative, research or practical tasks. The second goal of this stage is to organize an active exchange of ideas between students, which gives them the opportunity to expand their ideas by considering other answers and solutions. Each stage uses its own techniques and methods.

To date, the efforts of the enthusiasts of the RKCHP project have created an extensive arsenal of such techniques and methods, a detailed description of which is beyond the scope of this article. Therefore, below we list only some of the most common methods [21].

At the challenge stage, such methods as «provocative question», «brainstorming», «advanced lecture» have proven themselves well.

At the stage of reflection, you can use such techniques as joint compilation of the «final cluster», presentation before the «expert council» (created from the same group of students), «scientific reporting», as well as creative work. When writing such works, the form can be either absolutely free (such as «essay») or set («review», «letter to the editor», «letter to myself», etc.) [22].

A very interesting technique is «sinquain» - a creative work with a rigidly defined linguistic form (like the Japanese poetic style «haiku»), containing exactly ten words in five lines with a clearly defined semantic content. Moreover, these ten words should not only describe the subject of discussion, but also express the author's personal assessment, which, you see, requires not only a good understanding of the essence of the topic being presented, but also the ability to state it extremely concisely and clearly.

There is no doubt that with the growing interest in synergetics in education, more and more new methods and technologies will appear, in which the principles of synergetics will be partially or completely implemented.

In connection with the above, the following question seems appropriate: in what educational structures and for what educational contingent would it be most easy to implement the methods of the new synergetic paradigm? There is no unanimous opinion in the literature on this point. On the one hand, a number of authors quite reasonably believe that a new model of education should be introduced as early as possible: from the first grade, and better already from preschool institutions. Indeed, children at this age are well receptive to any innovation. Others believe that at present the most effective training will be for a contingent that is motivated for such training and already has a sufficient stock of pre-accumulated information and a way of working with it. In this case, we are talking, rather, about the second higher education of adults and additional education for high school students and students [233].

At the same time, a group of authors should also be noted who warn against overly zealous introduction of a new paradigm into secondary and higher education, and their arguments deserve the most serious study. Indeed, in the history of science there are enough examples of how the fashion for this or that science or scientific direction turned into a discredit of this science itself, because the methods of the latter were not applied where it should be and not in the right way.

But, one way or another, the ideas of synergetics will inevitably penetrate into education and leave their mark both in new methods and educational technologies, and in the content of the educational process itself [24].

One of the noticeable trends in modern development, due to globalization, is the aggravation of international competition in almost all spheres of public life. In this regard, the issue of increasing one's competitiveness is also becoming universal, affecting both individuals and entire states and even world regions. Taking this circumstance into account makes us turn to the search for competitive advantages (the presence of a rich resource base, favorable geographical location, the presence of a capacious domestic market, etc.), or modern competitiveness resources, among which high-quality human capital is of paramount importance. Moreover, the necessary high «quality» of this resource is given by education that meets the best world standards. It is the presence of such a full-fledged education that becomes a solid foundation for the progressive and sustainable development of the economy and science, the creation of new breakthrough production technologies that provide countries with a high level of education of the population with an unconditional competitive advantage in the modern world. Accordingly, the key importance of the education factor in achieving success makes it a mandatory and important element of the state development strategy, if not all, then the vast majority of countries in the world [25].

One of the main methods for achieving this goal is the introduction of innovative learning technologies into educational practice, and more broadly, the creation of an effective republican innovative infrastructure that includes innovative approaches not only to the actual content of educational materials, but also to the accompanying set of tasks and mechanisms to accompany the educational process. These include issues of financial management, the material and technical base of training, integration with production, interaction with future employers, cooperation with research centers, commercialization of intellectual products, etc [26].

At the same time, it is quite obvious that it is simply impossible to achieve visible results in innovative development without a corresponding reform of the existing system of training highly qualified personnel.

In practical terms, this means that higher education must now start active work on the formation of innovation-oriented educational and scientific activities. From this point of view, it seems necessary to take further steps to

reform the higher education system itself, laying in it the principles of operational adaptability, universal accessibility, material and technical equipment of the educational and research process, and greater autonomy of the educational process. The content, technologies of training and retraining of personnel for innovative activities, the innovative component of educational programs, including the adjustment of existing educational standards and quality criteria for the engineering and technical training process, should also undergo fundamental changes [27].

It should be noted that, in its best examples, innovative education is focused not so much on the transfer of knowledge that is constantly becoming outdated, but on mastering basic competencies, which then allow, if necessary, to acquire knowledge independently. That is why such education should be more closely connected with practice than the traditional one.

It should also be taken into account that innovative education involves learning in the process of creating new knowledge, which means the unconditional obligatory integration of fundamental science, the educational process itself and production.

Currently, the most successful in terms of ensuring the innovative nature of the development of educational activities are such higher educational institutions in which the following three types of processes are simultaneously implemented:

- development by students of real projects in various sectors of the economy;
- conducting fundamental and applied research;
- the use of educational technologies that provide students with the opportunity to choose courses [28].

In this regard, it seems necessary to take into account the world experience in creating research universities based on a network model for the implementation of innovative processes. In contrast to the linear and parallel models, which gravitated towards the former, traditional structure of the implementation of innovative processes, it is characterized by the presence of a concentrated network of small innovative firms operating in the latest sectors of the economy in close cooperation with research universities and centers. It should be noted that a fairly large percentage of these innovative firms arose as a result of «spin-offs» from university science of implementation and innovation companies (the so-called «spin-offs»), which relied on the commercialization of scientific achievements and university intellectual property. In terms of the implementation of innovation processes, these companies act as a mechanism for transferring technologies and know-how obtained at the expense of university science (including government-funded) to the market.

In addition, a feature of this model is the venture business, venture capital, integrating innovation and investment and focusing on the efficient use of the intellectual resource of leading research universities. Suffice it to say that almost half of all US venture capital companies are concentrated in the state of California, known for its «Silicon Valley», the core of which is Stanford Research University, the University of Berkeley, and the Los Alamos National Nuclear Laboratory [29].

Speaking about innovative technologies of the educational process, first of all, it is necessary to highlight the opportunities provided by information and computer systems. In this regard, as world experience shows, distance learning, the creation of electronic libraries, multimedia courses and electronic textbooks, the use of search engines, Internet education (e-learning) can serve as new trends. The main advantage achieved with the help of these innovations is not only an increase in the productivity and quality of education, but also an expansion of the educational audience, which makes it possible to involve both the students themselves and everyone who wants to acquire new knowledge and competence in the educational process. This circumstance is extremely important in modern conditions, when constant and relatively frequent changes in social production, which is increasingly based on knowledge, urgently require adjustment and clarification of the knowledge and competencies that specialists have, as well as obtaining the missing ones. This means mass demand, accessibility, openness of higher education, including the need to train the required competencies throughout the life of citizens. In this regard, the innovative benefits of new teaching methods are quite obvious, providing an optimal range of choice and giving flexibility to the start and end of higher education through the use of courses and curricula that are constantly adapting to the current and future needs of society.

In this regard, China's educational success achieved with the use of advanced information and communication technologies is very indicative.

The turning point in the development of China's education system came in 1986, when there were major changes affecting four innovative areas of higher education: passing entrance exams, determining the target audience, the system for implementing educational material, and the management system. Taking into account the scale of the country, the use of a combinatorial system of education, which organically combines both traditional and innovative forms, was recognized as the best way to bring the education of the population to the

modern level as soon as possible. At the same time, the first and main role in the development of higher education in the PRC was played by radio and television, which are now, along with the Internet, the main means of implementing training programs in the higher education system of China (distance learning). Following this path, it was decided to create a system of Central Radio and Television Universities (CRTVU) at the state level [30].

Universities CRTVU (central level): make long-term plans for the development of the RTVU system and annual plans for admission; manage the PTVU University Learning Management System and coordinate academic work carried out jointly by several PTVU Universities; draw up national curricula and create programs for national implementation; develop and publish printed teaching materials, and produce and distribute audio and video cassettes for nationwide courses; prepare unified examination papers, introductory and for delivery at the end of the semester, develop standards; organize the training of teachers, administrative workers and technical specialists for the national RTVU system; conduct research in the field of higher education and organize the exchange of experience with similar national and foreign educational institutions [1].

PTVU Universities (regional level): run the learning management system for affiliated schools of PTVU universities, system workstations and educational classrooms attached to them; organize the implementation of curricula drawn up by the CRTVU and draw up curricula for courses offered at the provincial level; create and implement training programs in the regions; develop and publish printed educational materials, as well as produce and distribute audio and video cassettes for courses; organize examinations, entrance examinations and for delivery at the end of the semester, and verification of examination papers; supervise the admission of students and deal with the issuance of diplomas / certificates; organize the training of teachers, administrative workers and technical specialists for regional RTVUs; conduct research in the field of higher education and organize the exchange of experience among themselves [7].

For a quarter of a century, this system of distance learning has already provided China with several tens of millions of trained specialists and workers, who constituted the main production resource of the economy of this previously backward and semi-literate country, unprecedented in world history. It remains only to add that the success and effectiveness of this educational method was largely due to the universal cult of learning, carefully and comprehensively supported by the Chinese state among the population.

According to the reporter, Berkeley University in the United States has posted on the Internet freely available video files with lectures by its leading professors (so far in English, but they are planned to be translated into other languages in the future), including Nobel Prize winners. According to the hosting, more than one and a half million subscribers have already connected to the university's website, and their number is constantly growing. Other leading universities in North America have shown interest in this innovation, and are also planning to start distributing their educational programs to everyone.

It seems that the adaptation and dissemination of such progressive experience could help improve the efficiency and quality of education in our country as well. This would be fully in line with the «World Declaration on Higher Education for the 21st Century: Approaches and Practical Measures», which clearly articulates the task of redesigning all curricula using new methodological and didactic approaches that limit cognitive learning and ensure the formation of skills, the development of competence and abilities related to communications, creative and critical analysis, independent thinking and teamwork [7].

According to the World Trade Organization, the capacity of the global education market is 50-60 billion dollars. The steady leader is the United States, which controls almost a quarter of the world's financial educational turnover. In second place in terms of educational sales is the United Kingdom with 15 percent. Following are Germany and France: the first holds a little more than 10% of the world market, the second a little less. Australia, Canada and Spain complete the leader list, having mastered 7-8% of the market each. Kazakhstan in this «competition» is simply not quoted.

The ungraded system is most often used in the first 3 years of study, although there are schools where it exists for all 6 years. The training program is divided into 8-12 levels (levels). Children study independently in small groups, which are formed from children of the same abilities. Students move on to the next level as soon as they finish the program of the previous one, without waiting for other students. Thus, a part of the students can complete the three-year program in 2 years and move on to the intermediate cycle of primary school (years 4, 5, 6), in some cases also ungraded. For other students, progression through the levels may take 4 years or more [2].

The ungraded school brought with it many changes, including architectural changes in school building. In particular, she introduced teaching by teams of teachers in the elementary grades, an innovation originally intended for the secondary school and giving rise to the «school without walls.»

Today, a third of all elementary schools practice teaching by teams of teachers. The bottom line is that two or more teachers working with primary school children form a team led by a senior teacher or foreman. Jointly planning the work, they organize it in such a way that part of the classes take place in large groups, when all the students gather, part in small ones (10-12 people, grouped according to their abilities). At the same time, teachers monitor the independent work of children.

Brigade training required redevelopment of the school premises. In the state of Philadelphia, for example, a number of schools built in recent years in wealthy suburbs do not have solid walls separating classrooms. Classes are held in a large hall with corrugated movable partitions. Up to 100 children can study at the same time with 4-5 teachers. One and the same child can study with a teacher who teaches «level 5» while reading, and when it comes time for arithmetic, he goes to the other end of the hall, where he studies with a teacher at «level 3», etc. In some classes, for example, on civics, music, singing, children gather all together.

In the state of California, for example, mixed-age grouping has been recognized, when educational groups are made up of children of different ages (for example, grades I, II, III or IV, V, VI). According to the authors of the project, the composition of the group of different ages has three advantages: firstly, the teacher cannot set common tasks, use common textbooks, and thus he is forced to work individually with students; secondly, the student moves forward faster, because he learns a lot from older comrades; thirdly, the process of social maturity is faster.

In a number of schools, a «dual plan» (dual progress plan) is used, according to which the elementary school subjects are divided into two groups: «essential» and «elective». After the third grade, students spend half the day with one teacher, studying the subjects of the first group - language, social studies, physical education. The second half of the day is devoted to elective subjects, which are mathematics, natural science, a foreign language, art, music. Here, each student works on an individual program with teachers.

It is also necessary to note the social mechanisms and forms of interaction of a gifted student with teachers and mentors. The right choice of a teacher often predetermines the success of the entire process of teaching and educating the personality of a gifted child. A teacher starting work on the program must have a high professional level, be able to establish friendly relations with students, and implement a creative approach to learning. Based on the research of the American teacher S. L. Berger, the functions of a teacher working with gifted children are highlighted. Teachers can help the gifted by working with subject teachers. Together they can modify the schedule, change learning strategies, choice of opportunities, curriculum goals, and improve the assessment process [5].

The use of mentoring programs is today one of the most effective conditions for improving the education and training of gifted students in the United States. Relationships with a mentor provide an opportunity for gifted young people to solve problems such as: planning for a future career, developing the ability to identify priorities and set long-term goals. The mentor acts as an adviser, consultant, is a model of behavior for the student, if necessary, plays the role of a critic, if this can facilitate the achievement of the student's goals.

CONCLUSION. So, in the educational process, synergistic pedagogical technologies are the guarantors of providing multivariance. Synergetic learning provides each student with the opportunity to move independently and extraordinary towards success by creating conditions for choice and alternative. The student begins to understand himself, his abilities, interests, strengths and weaknesses, talents and life priorities.

However, in our opinion, the synergetic approach can be adapted not only with other interactive pedagogical methods. He must use the achievements of the traditional form of education and supplement it. As noted in the work of V. Ignatov in the use of synergetics, one cannot discard the positive that was revealed before it using classical dialectics. These are two interrelated and complementary forms of comprehending the laws and patterns of the educational process.

The prospect of research is the development of the chosen topic in a narrower direction.

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