Education and Globalistics

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It is shown that the study of global processes and globalization is already taking effect on the prospects of global transformation of education, which can not only find their planetary community and integrity, but also a tendency to fill its subject field with global content. It is noted that education should be not only upgraded, but also futurized, in certain aspects, to become a leading education, effectively paving the way to a desired global sustainable future. It is assumed that the formation and evolution of models and types of global education will be run by a new type of global research — education and globalization as an interdisciplinary field that connects global studies and the science of education. Among the common and the most important global processes in education, which will study the educational globalistics, processes such as globalization of education and the formation of global education and the patterns of their evolution.

Key Words: globalistics, global processes, global education, educational globalistics, anticipatory education, education for sustainable development, sustainable development, futurization

Introduction

Phrases stating that we live in the age of globalization, are in a state of global revolution, entering the global age, etc. have become more and more common. The term “global” is appearing in daily life increasingly, marking a new look at the world around us — a world which we already view as a global world. In this situation it is important to find out: how science reflects the current global situation and orientation of our life? What processes and trends are of scientific knowledge, which should not remain indifferent to the ongoing and future global changes? Moreover, indeed, since the last century, science began to be interested in all sorts of global phenomena and mainly towards the end of the second half of the 20th new scientific disciplines and areas of research emerged and began to focus on global issues.

The emergence and development of globalistics and other forms of global scientific research was inevitable scientific response to the global challenges of 20th and beginning of 21st century. Awareness of the importance of globalization, global issues and other planetary
phenomena and understanding of the prospects for further deployment of total global activity has become an important area of scientific research and a new stage of development of modern science. Global studies have nominated to leadership in scientific-educational process and become one of the foundations of modern scientific world view and outlook.

In recent years the attention of global knowledge, i.e. knowledge concerning everything that exists and develops on the planet Earth in the context of planetary integrity, has been focused mainly on globalization and global issues, thus the “centre of gravity” is now shifted strongly towards the study of the issues of globalization. This is indicative of the fact that over time the subject field of globalistics has been changing, and as we will show, will continue to evolve rapidly. It becomes apparent that among global phenomena, besides those mentioned, there are others that should be studied by globalistics, if it is considered more broadly and deeply in the sense of knowledge of the nature and origin of these phenomena than it is now used. In this broad sense, globalistics, in the opinion of the authors, should study global processes and systems, identify patterns and trends in their existence and development.

We will see that globalistics, turning into a complete scientific and educational discipline, however, goes beyond this and in interdisciplinary dimensions developed in a number of trends, including the space of scientific knowledge and creating new research areas, interacting with other branches of science. New subsections or research areas of globalistics continue to emerge, that have cropped up almost every year (to a number of them, in whose creation the authors of this work participated, we will devote special sections).

In connection with such a broad interdisciplinary “scope” of globalistics, there is question by scientists, sceptical about the global field of knowledge: Do not blow globalistics all science? This question can be answered in the negative, since all science cannot be represented as a “sprawling” in its space globalistics. Between globalistics and all other sectors and areas of knowledge, and along with them, there will always be some other, including globalized scientific knowledge. Thus there is intuitive feeling about the limits of the current active expansion of globalistics, but it is difficult to specify those boundaries in advance. However, it is hardly possible to establish the limits to process of globalization of science, although some of the considerations in this regard are below.

If we take as a starting point that globalistics is studying global processes and systems, we can deploy substantive field of globalistics and the entire global knowledge somewhat differently, and on this basis also the emergence of new areas of global activity, and especially of global education. Until now, globalistics has only begun to form its subject field in research and in educational perspectives. With recognition of the fact that the subject of globalistics focuses on the global processes and systems in their evolution (or rather, co-evolution), the situation has radically changed.

Adequate understanding of this research process will also enable better focusing of the process of establishment of different sectors and areas of global practice. Because understanding of the place and the role of various global phenomena in the evolutionary processes on the planet and in the universe as a whole will optimize practical activities aimed at the survival of civilization and the preservation of the natural foundations of its existence — the biosphere [Bazaluk, 2015]. The global science trend has a particular importance for global education that facilitates the formation of planetary and advanced consciousness, capable to realize these humanistic goals and contribute to the establishment of global governance to the greatest extent. Beginning with the scientific-educational
creativity of Vladimir Vernadsky global direction of education was formed, including both the globalization of education and formation of global education.

Therefore, further development of globalistics and global studies has not only research, but also educational and methodological aspects. Research aspect means much more profound degree of understanding, developing and predicting in perspective the ways of global studies development, and in particular, globalistics as a new fundamental sphere of interdisciplinary studies that affects the process of globalization of whole science in general. The educational aspect is related to the research one and focuses on the introduction of the new knowledge obtained in the course of the research into the learning process. This is reflected both in the establishment of special training courses, and in the formation of a “global” reserve in the traditional courses already underway, linking subjects and methods of their research with emerging global knowledge.

Education as socially organized institution on a global scale at the beginning of the third millennium is on the radical change of its development. Being one of biggest social mechanisms of more or less normal functioning of society, education should change the content and form of its own development in such way in order to promote further survival of civilization, its way out from still deepening global crisis. Such a crisis of anthropogenic origin is intensified as a result of the increasing challenges and other negative global processes, which become larger and threaten the existence of mankind and all life on the Earth.

Therefore the crisis has become global and threats to human existence got worldwide character and scale (for example, environmental problem). It is impossible now to get out of the crisis without the use of proactive mechanisms and factors (one of the main ones, as it will be shown, is the proactive education). Therefore, if global environmental or worldwide catastrophe happens, there will be nobody to eliminate its consequences.

The bigger the disaster, the more difficult it will be to struggle with its negative impact on mankind and therefore means of eliminating of global crises and catastrophes, solutions of global crises and catastrophes in principle should be proactive rather than “lagging” as the elimination of the consequences of local emergencies and catastrophes.

“From the elimination of the consequences of catastrophes to prevention of them” — this is a fundamentally new strategy to combat any negative processes, and for global processes this is the main and perhaps the only temporal strategy. It is possible that a number of cyclic processes in the world (global) economy and other spheres of human activity can be “smoothed” by using of preventive measures to prevent negative components of cycles if they have anthropogenic and not natural dominant.

Anti-crisis responses to global challenges lead to the transformation of the global development of civilization and they begin already to affect significantly the expected forms and models of education of the 21st century. Education in principle should promote forms of social development and socionatural interaction that will implement the strategy for the survival of humankind and the biosphere preservation more effectively, ensure our overall sustainable future.

**Formation of a global education**

However it is necessary to ascertain that the world education has turned to be inertial-conservative social system that no longer meets the needs of contemporary life and basically models the past of our civilization and its science in significantly deformed form [Botkin et al,
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Education as a social mechanism of the formation of man is very weakly concerned with the decision of immediate and especially global issues, many of which threatened destruction of humankind and the destruction of the biosphere. Quite often, they talk about the lag of education from practice, referring mainly to those forms of practices that are specific to the current model of unsustainable development (unsustainable development). Meanwhile, it is obvious that further strengthening of link between education and contemporary practice of unsustainable development leads to bigger deepening of the global crisis of civilization as well as its education.

It is impossible to solve effectively global and other issues by means of such “lagging” and inadequate for creating of sustainable future education and therefore it is “detached” from active participation in the search for optimal solutions in anti-crisis activity and it does not promote the survival of civilization. Therefore, at the beginning of the third millennium humankind should radically change the model or the form of their development so that it could adequately respond to global challenges and threats, to ensure its further secure and sustainable development. Being one of the biggest social mechanisms of functioning of society, education should change the content and form of development in such way in order to contribute to the survival of civilization. Now it basically does not perform this “saving function” because to a large extent it is one of the most conservative areas of social activity and significantly it is focused on our common past. Meanwhile, the “survival through education” is a kind of motto, slogan of fundamentally innovation process in education, which meanwhile concerns not only a single person, but also humankind as a whole.

The basic idea of the proposed conceptual and methodological approach to the study of prospects of world education is that education needs to be focused on such proactive global transformations that are closely linked to the evolution of civilizational process and the interaction of society and nature [Ursul & Ursul, 2012; Ursul & Ursul, 2013a,b]. This will not be just one “final” model of education of the 21st century (for example, only a model of education for sustainable development, as already discussed [Environmental education, 1996; Casimov, 2004; Stepanov, 2009; Ursul & Ursul, 2012; Ursul, 1995; Ursul, 2012; Ursul & Ursul, 2011; Ursul & Ursul, 2013a], but an evolutionary number of models and strategies of consecutive global educational processes and systems to facilitate establishment of a new, more secure civilization, providing co-evolutionary interaction of society with existing biosphere.

A characteristic feature of the emerging new models and forms of education is their global nature, what is quite obvious in conditions of globalization and the impact of other global processes on education. In our opinion, the evolution of these models of global education will be the field of an educational globalistics as an interdisciplinary field, linking globalistics and science of education.

If the pedagogical aspect of global education is studied, in this case we can talk about a pedagogical globalistics, or even “global pedagogy.”

Among the most general and most important global transformations of education that will be studied by the educational globalistics we can mention such processes as globalization of education and establishment of global education. Global education should be distinguished from the globalization of education, although they sometimes cannot be distinguished, that have already attracted attention before [Ilyin et al, 2011]. Globalization of education relates more to the process of formation of integrity, interaction and integration of various national state and regional public educational systems in the future. The same purpose is transnational (trans-boundary) education, when, for example, students who live in one country, receive
educational services mainly remotely in universities of other countries.

The term “global education” is appropriate to use to describe the qualitative and meaningful transformations in the global educational process, whose subject field is being “filled” with global knowledge and worldview, as well as innovative content, appearing as a result of global studies and the general globalization of science.

We consider Vladimir Vernadsky as an originator of global education and it follows from our previous statement. Scientist lectured at Moscow University at the beginning of the last century. These lectures contained the “embryo” of global education. His general conceptual reflections on education actually contain the basic ideas of global education, which is now developed on the basis of global education [Vernadsky, 1995].

However, the term “global education” and first concepts of this new type of education originated in the 1970s in the United States as “an educational response” to the first conscious global challenges and the prospect of living in an interconnected world on the planet. In 1970, the American Forum for Global Education was created. It is a non-governmental organization that oversees development of global education in the U.S. and beyond. On the initiative of this Forum in 1995 in New York, UNESCO held an international conference “Bridges to the Future”, which defined the main fields of development of global education in the 21st century, whose purpose is to prepare the student for living in a dangerous, dynamic and interconnected world, who will be ready to solve growing global issues.

Now global education is considered in a new form in comparison with mentioned years of the last century, when this model was proposed by U.S. pedagogues. James Botkin and Robert Henvi [Botkin et al, 1979; Henvi, 1994; Liferov, 2009]. Models of global education that emerged in the U.S. in the 1970s of the last century are based on the representation of the world as a whole, and humankind as a huge interconnected global community, where life activity and wellbeing of each person depend on all other people. These models, which are based on the principles of globalism, holism, humanism and an interdisciplinary approach, to some extent are presented as one of directions of integration of a single world educational space, opening new global perspectives.

James Botkin (one of co-authors of the seventh report to the Club of Rome) in his proposed model of globally oriented education and innovative teaching believes that traditional education is focused on the unconscious adaptation to reality. Meanwhile, it is important to make the transition to conscious prediction on the basis of an innovative approach.

Complicity and anticipation should be unified in the innovative approach. Anticipation means the ability to anticipate events and their consequences make decisions, share responsibility for them, linking the past with the present and the future, offer new possibilities and alternatives. Complicity suggests the possibility and the capacity for dialogue and mutual understanding, cooperation, empathy, improvement of communication skills and abilities.

Robert Henvi bases his model of global education on several principles (planetary dimensions): the formation of an objective understanding of the world, study of the state of the planet, cross-cultural literacy, understanding of the dynamics of world processes, awareness of opportunity of choice.

In the 60-70 years of the last century elements of global knowledge just began to emerge, basic approaches in not yet widely “declared” globalistics were formed.

Moreover, most likely, it was the time of formation of still syncretic global worldview — globalism, which is based on the concept of the world as a whole and humankind as an interconnected global community.
At this time a way of worldview, in which general planetary characteristics prevail and awareness of complicity to humankind problems and global processes happened, was formed.

Global education emerged on the same “global wave” as other intellectual and spiritual phenomena. It is relatively not yet differentiated global worldview and knowledge was presented in pedagogical sciences in the form of first concepts of global education.

The evolutionary sequence was not so clearly expressed — global knowledge first, and then on its basis formation of global education. At first glance, it even seems that the emergence of global education preceded the emergence of global knowledge. However, this is not the case. In some extent, the creators of first pedagogical concepts of global education based them on accumulated knowledge about global phenomena, as it is clear from even brief presentation of their concepts. Now concepts of global education continue to evolve, adopting new forms, whose metamorphoses were not thought over by the creators of original concepts.

Anyway, we would like to draw attention to the problem of global knowledge, which is the result of global already conducted studies. Indeed any concepts of global education should be based on the global knowledge, on those forms of it that have already been obtained in science. Moreover, although it is undeniable that during the educational process a new, including global, knowledge can also be generated, nevertheless the predominant part of this knowledge is a result of scientific search. Global knowledge displays real global processes and, at the same time, should anticipate and predict them, directing global thinking and global activity in the desired direction for man and humankind.

As the authors of the introductory article to the almanac “Evolution” note, “global world (which it is becoming now) requires a global knowledge now” [Grinin et al, 2009: 7]. In our view, global knowledge is integrative general scientific knowledge, which is obtained from the study of global processes and global evolution, which in the future will serve as fundamental platform of development of all science and education of the 21st century. This new form of knowledge is necessary not only for science but also for many other spheres of practical activity, which are getting filled with global content, and primarily for education, which gradually becomes, using already obtained global knowledge (and partly creating a new, particularly in terms of pedagogy), fundamentally a new type of current and future education — global education.

Consideration of issues of global education has led experts in the field of pedagogy to the opinion that it provides education of students interest and respect for the cultures of the peoples of the world, gain of an understanding of common global origin of these cultures and attention to global events, awareness of their character and anticipation of the consequences, use of a systemic approach to the study of global processes.

Recently issues of formation of global education were associated with the prospects of open and distance education, primarily via the Internet. However, along with the formal organizational and technological aspects related more to the issue of globalization of education, conceptually meaningful aspect of global education was developing. Above all, we are talking about teaching of globalistics and concept (strategy) of sustainable development as already developing global process (now mainly in high school).

**Evolution of the global education**

Development of global education can be considered as a stable trend of last four decades and achievable positive perspective of further transformation of subject field of the educational
process, which not only gets its planetary commonality and integrity, but also detects the actual and potential opportunities of globally meaningful evolution. As mentioned, these opportunities were first implemented in the transformation of contemporary education (including now existing experimental options for global education) into education for such global process of sustainable development (sustainable development), which is accepted by the international community and evolves into noospheric formation during the subsequent formation of the sphere of mind through the global transition to sustainable development. At least, they are next two stages of largest and most anticipated globally evolutionary transformations of world education in the field of planetary development, which is considered here.

These are stages, which should be studied in detail by the educational globalistics.

It is not just very inefficient, but really impossible to manage the processes of globalization and solve global and other issues effectively by means of contemporary, but “conservatively lagging” education. Education “is detached” from active participation in the search for optimal solutions in the emerging global anti-crisis activity and is not conducive to the survival of humankind. On the contrary in contemporary “conservative” form it contributes to the further “slipping” to global anthropogenic disaster, not giving the necessary knowledge and skills to get out of growing planetary crisis.

The current global transition of civilization to sustainable development and its coevolutionary interaction with nature raises the question of radical transformations of all forms and areas of social activity, including education.

The new model of world education must comply with the model of sustainable development of civilization and facilitate an innovative transition to global sustainable future.

As noted, the evolution of global education is implemented first in the transformation of contemporary education into education in the interests of sustainable development as the main educational process of the 21st century, whose preservation and development is aimed at achieving the goals and principles of sustainable development of global community. In the future education for sustainable development during noospherogenesis will be transformed into noospheric education, and in parallel with it and even more so in the future into the “globally-evolutionary” education, which is oriented at significantly more developed by noospheric science global evolutionism as a main integrative general scientific core of scientific and educational process of the present century [Polischuk, 2015; Ursul, 2015].

In relation to the formation and evolution of global education along with evolutionary there is a proposed so-called ontological approach, when education is considered not only as individual public (in the system “man-society”), but also as a universal global creative form of development, when all universum, not just socio-cultural, but also globally-natural (and universally-cosmic), being involved with man, co-evolutionizes and informationally affects the formation of personality.

Perhaps, in this broadest representation of the educational process the formation of man is considered through “the prism” of global evolutionism in a more general — socionatural system “man-society — nature”. It is not just one of the processes of socialization of man, but his perception of informational evolutionary interaction with entire universe in its social and natural aspects. From the standpoint of this (so called globally-evolutionary) approach education implements the function of formation of man by informational processes in planetary cosmic system of evolution “man-society-nature”. In this interpretation education is not simply as a student-centered process of socialization of the individual, but as an informational and co-evolutionary process of interaction of man, society and nature.
Not only spatially global but also early mentioned its temporal integrity is important for optimization of the development of the global educational process (as well as for other spheres of human activity), which is one of most important historical and evolutionary principles. Education in contemporary super dynamic global situation cannot be limited just by continuation of translation of knowledge and other information, reflecting the world of the past and partly happening.

Proceeding from the principle of temporal integrity and identified above perspective of the evolution of the global educational process it is possible now to offer some recommendations for the contemporary development of global education, which have practical values. This refers primarily to temporal optimization of educational courses, which are included to education, i.e. gradual but discrete introduction to practice of such elements and factors (teaching materials, programs, courses and etc.), which will determine future pedagogical process from a content point of view. Main process of futurization as evolutionarily temporal optimization is in this strengthening inclusion of “factor of global future” in modern education.

Global education will fully become a proactive education, particularly if it is combined with its fundamental nature and humanization.

Now it is important to summarize the practical development of global education in dozens of countries around the world (including Russia), where already first “sprouts” of this type of education, facilitating obtaining of planetary unity of educational space emerged.

In our country until recently, global education was developed within the framework of main study activity (the concept of global prospects etc.). Practical activity in other areas of global education was realized in experimental educational projects for the development of a global mindset of active “citizens of the world” (mainly through the associated schools and the number of UNESCO Chairs).

Such highly amorphous syncretic understanding and representation of global knowledge, which was used in first concepts of global education, differs significantly from its current representation, as discussed above. It is important to continue the positive trends and fields of development of global education both in terms of expanding of the teaching of results of global studies, including as new global phenomena as the concept and strategy of sustainable development into the subject field of educational activity (especially in their noospheric orientation).

Currently education generally corresponds to both industrial and to some extent a post-industrial society. However, global transformations of education are not only aimed at the creation of an information society and the knowledge society, but planetary civilization and sustainable development, realizing the goal of survival of civilization and the biosphere preservation. These features can be implemented first in the transformation of contemporary education (including now existing experimental options for global education) into education for sustainable development.

Hereinafter emergence of noospheric education in the process of further formation of sphere of mind through global transition to sustainable development is proposed.

At least these are the next two stages of the largest and mostly anticipated globally evolutionary transformations of the world education in planetary field of development, which is considered here.

There is a certain measure between conservative and innovative trends in any process of development. Education is clearly not focused on innovative processes. Therefore, innovative processes in education in the future get a new orientation: it is necessary to transform education
so that it was possible to implement the transition to our common future — sustainable development. After all, contemporary man, who even mastered the knowledge and cultural achievements of unsustainable development model, will not be able to build a new global society with sustainable development. Only innovative transition from unsustainable to sustainable society can guarantee the satisfaction of the vital needs of both present and future generations of people and their more harmonious interaction with nature.

Globalization and integration of educational space [Liferov, 2009], the acquisition of a planetary unity and integrity cannot be subjected to meaningful and qualitative changes, showing global character of the evolution of contemporary humankind and awareness of his place in the universe. Formation of contours of globally integrated world is somehow manifested in educational sphere, which still with some lag “copies” mentioned global and civilizational aspirations. However, it is clear that education should not remain on the periphery of the overall global development as a traditional part of this process and particularly important to become a “catalyst”. Moreover, we can assume that without specially organized learning and education humankind will not be principally able to make a transition to sustainable development and followed by one of the forms of civilization process, ensuring its survival and its indefinitely long existence.

In this regard fundamentally new conceptual and methodological concepts and approaches to the study of evolutionary processes in education are necessary. In connection with the development of global studies it is appropriate to talk not only about their introduction into the educational process, but also about formation of “educational globalistics” (“pedagogical globalistics”) and, perhaps, a “global pedagogics”.

Informatization of the global and anticipatory education

Formation of an idea of proactive education for sustainable development is concerned more with information and informatization, than with ecology and ecologization [Colin & Ursul, 2015]. Right on the way of informatization and formation of virtual reality in human activity in general, and in science and in education in particular, there is a possibility of proactive modelling of reality. Formation in the future of global noospheric intelligence, which most fully implements proactive modelling of socionatural processes, leads to the fact that it will be possible not only to display of not only the past and present but also the future and formation of rational and efficient socio-ecological development on this basis.

As the property of anticipation in education (and actually in all other forms of activity) is directly associated not only with environmental but with information issues, then in the future we are talking about the formation of the information society, which will be part of the sphere of mind — the noosphere, whose ideas were expressed by Edouard Le Roy, Pierre Teilhard de Chardin, and Vladimir Vernadsky at the beginning of the last century. Formation of the most reasonable sphere of interaction between nature and society through the transition to sustainable development happens right on the way of noospherogenesis, including ecologization, informatization, futurization and many other global positive processes and trends [Ilyin et al, 2011].

In education, noospheric trends are most clearly manifested on the way of formation of so-called “smart education” [Tikhomirov, 2013]. Intensively developed mainly in the West concept of Smart education suggests transfer of the educational process mainly into the electronic environment, providing effective education in this interactive environment using
freely available content from all the world. Smart education through the introduction of e-learning makes learning available anywhere and anytime, combining educational institutions and teaching staff to implement joint educational activity on the Internet (which is one of the main sources of knowledge for the student). Smart education is a flexible learning in an interactive educational environment, implementation of educational activity on the Internet on the basis of common technologies, standards and agreements.

Information society in all its possible variants (knowledge societies, education societies etc.) will have to function as a component of the sphere of mind and certainly, it must become proactive social system in planetary scale.

Therefore way out of the current global crisis of civilization is in the evolutionary transition to the way of formation of information society as one of levels of the sphere of mind, while according to general strategy, way out of the global crisis of education is in the transformation of inertially lagging, conservative educational system into innovatively proactive and in the future the noospheric educational system. Without informatization formation of such brand new education is in principle impossible and therefore most radical innovative processes in education are presumably related with the transition to the information society, being an important feature of the global transition to a way of sustainable development.

New proactive noospheric innovatively educational system must comply with information society with sustainable development, based on knowledge and information.

We intentionally focus attention on the information aspect of education: property of anticipation is a brand new mechanism of its formation. Here information factors are a priority component of upcoming globally noospheric and initially information civilization. In this sense, property of “anticipation” is inherent not only to education.

So-called anticipatory reflection presumably emerged in the process of evolution of life [Anokhin, 1962]. According to Petr Anokhin, this type of reflection is like the accelerated model of what else should happen, to the highest extent fast reflection of future events of the outside world. Anokhin believes that proactive reflection of reality is the main form of adjustment of living matter to the space-time structure of the inorganic world. Anticipatory reflection acts as a temporal reaction of a living organism, which was previously prepared near consistently repeated impacts from the environment.

Previously it was assumed that anticipatory reflection emerged only at the level of living matter. However, in our view, proactive reflection still first emerged and existed in inanimate nature, in any case, in the real, observable universe. It was formed in the first moments after the Big Bang in the so-called inflationary futurization [Ursul, 2012], in any case, when four kinds of fundamental interactions were formed from a single physical interaction, whose aspect is the reflection.

Furthermore, there are grounds to believe that exactly anticipatory reflection and temporal futurization as ultrafast extension of time into the future are ones of motors of the universal process of evolution, what until recently was not in the focus of attention, emphasizing on spatial expansion and leaving temporal characteristic of adaptation, coevolution and evolution actually in a state of even flow, as in the contemporary era. However, anticipatory reflection in inanimate nature presumably in post-inflationary era was already sporadic and was manifested in a small scale, and therefore it was not noticeable as in living matter. With the acceleration of evolution on its main progressive trajectory (superhighway) there was a process of a larger formation of anticipatory reflection in the higher material systems by level of development.

Actually, property of “anticipatory” will be characteristic for all upcoming era of the noosphere. The emergence of the latter from sociosphere is associated not just with the fact,
which mind will take a priority position, but also with the fact that “proactive” intelligence will be not just for individuals, but integrated into the noosphere as a whole, i.e. noospheric intelligence. Noosphere will differ from sociosphere not just by its informational potential, but also the fact that the latter in form of noospheric intelligence will anticipate, predict, forecast and manage activity of noospheric civilization. All fields of this activity will be “anticipatory” — scientific studies will be anticipatory, education in its sustainable noospheric form will also be futurizing, management will be functioning in proactive regime, forming intellectual information base of education for sustainable development. In this respect, “smart education”, which began to develop nowadays, becomes noospheric education only during globalization and futurization after gaining a property of “anticipation.”

The emergence of innovative proactive processes in global education leads to significant futurization of it and formation of anticipatory education. The latter will not only develop faster relatively to global practical activity, but also to focus on the future in the content of learning, development and education, basing on the principle of temporal integrity. In this sense during the evolution of global education, there will be a shift in emphasis from modernization of education to its futurization and formation of global noospheric education through education for sustainable development as a contemporary prototype of future noospheric education.

Taking into account mentioned earlier, there are other arguments in favour of the formation of anticipatory education, for example, in connection with already mentioned studies of the formation of noosphere. We note that the noosphere is often understood as a sphere of interaction between society and nature, within which reasonable human activity becomes the determining factor of the development. Such an understanding of the noosphere is still prevalent in the post-Soviet “scientific area” (including Russia), and this interpretation can be found in the works of Vladimir Vernadsky [Vernadsky, 1991; Vernadsky, 2004].

However, the “intelligent human activity”, being dominant in the field of socio-natural sphere, is not rational, because, as noted, in the future leads to a global anthropocological catastrophe. Therefore, it is natural to assume that the noosphere is not a contemporary prevalence of the human mind in its interaction with nature and the rationalization of this interaction, giving a coevolutionary harmonious character to it. This is condition for the survival of mankind and the noosphere should be defined as the future state of socio-natural sphere, which ensures the survival (preservation) of mankind and the natural conditions of its existence on the planet and in space [Bazaluk, 2013; Bazaluk & Blazhevich, 2012; Ursul, 2015]. Meanwhile of not only the current and next generations, but also future generations of people, what the concept of sustainable development suggests. That is why we believe that the emergence of the noosphere and the transition to sustainable development are not just close processes and the formation of the sphere of mind begins through the transition to sustainable development and is significantly increasing with the gradual inclusion of information and intellectual factors in the overall global development.

This transition will gradually lead to the fact that humankind will have a new state of collective consciousness, which was called a noospheric intelligence (despite some editorial tautology). Such an integral hybrid (human-machine) intelligence will have a quality, which is absent in contemporary social consciousness (especially for all humankind), which lags significantly behind social life and therefore cannot fundamentally implement the formation of the noosphere and the transition to sustainable development. In order to do it noospheric intelligence should possess property of anticipation of social life, directing it to the optimal trajectory of survival (existence). The need to develop a new form of integrated intelligence is caused primarily by existential circumstances.
There is a conclusion from proposed property of anticipation by noospheric intelligence of mankind being, that a priority mechanism of formation of such intelligence is science and education not in its contemporary states, but brand new anticipating education and science orientating in its basis on transition to SD [Environmental education, 1996; Ursul, 1995; Ursul, 2008b; Ursul, 2012; Ursul, 2015].

Translation of outdated “educational knowledge” from previous generations to current, on what contemporary education is basically oriented, does not mean that it helps to solve the pressing problems of today, and even more tomorrow. The reason for this situation is the fact that the existing knowledge, skills and achievements of culture and circulating in education, are not just outdated, as already discussed above. They are a reflection of a fundamentally different model (form) of social development — model of unsustainable development — USD. Mechanism of accelerated futurization of education and formation of anticipatory education must be included. These two processes in education are very closely correlated with the processes of globalization of education and the formation of global education (globalization with futurization and the emergence of anticipatory education with the formation of global education). Educational process becomes gradually and increasingly a leading innovative proactive and in addition global process and rapidly include all, what does not exist yet but will or may occur in the future.

It is obvious, that this task was not set by pedagogical sciences and other sciences, studying the educational process. This may be absurd, a kind of nonsense for the traditional thinking of the teacher. How to teach what does not exist yet and why new knowledge should appear in education?

However, the inappropriateness of such a question is absent, if you carefully study the process of implementation of the future and new to the educational process.

If translation of outdated knowledge in the educational process will not help the transition to a sustainable global future, it means that process should be radically changed, making it innovative largely, adapting traditional linearity and conservativeness of pedagogical mind-set.

For the survival of humankind and its transition to sustainable development, it is important to include proactive factors and mechanisms of this process, to predict and forecast the future. Moreover, if it is clear that innovative transition from unsustainable development to sustainable is necessary, it is important to bring together all existing and possible forms and trends, which can solve this basic civilization issue of the third millennium. In fact, if pedagogical science was not based on “historical” and “translational” model of education, but was based on information and ontological model of the educational process and it would become the official global setting, it could be possible to put the question earlier about the total innovatization and futurization of education and especially the development of anticipatory and global education.

In the educational process information should be transmitted not only from past generations to the present, but also completely new information from the not yet existing future generations to the present (in the form of virtual models of study of future), as well as information about the future from the current generations. In this proposed innovative and information virtual model of the educational process past, present and future will be connected to one systemic temporal integrity. However, here comes the next question: how to obtain new information from the future and about the future?

Such information and educational virtual model contradicts not only a traditional pedagogical science, but also generally contemporary science, which relies on the facts, practice, truth and other similar concepts that form the foundation of the study process. It is obvious that the knowledge
about the future cannot contain the truth and facts, which are checked in practice in past and present. In this sense, future is detached from official (factual) science, although the prediction and forecasting is recognized as a function of the theoretical level of knowledge. However, if you look closely at what is written in this case about the study of the future, actually main focus is on a linear vision of the temporal process (extrapolation of evolutionary historical trends into the future).

This means that in study of the future and its implementation in the educational process new principles, ways and forms of exploration of the future will be realized.

One of the fastest growing forms is the modelling of what may happen in the future, i.e. proactive modelling in its various forms and especially using new information technologies. This is the way of implementation of the future in innovation and the educational process, which involves the computerization, because only at the information level it is possible to make and study models of the future as regulatory (such as strategies of sustainable development), as research forecasts and predictions. There are possible as linear ways to the future from the past and present, as nonlinear innovative breakthroughs to the extent that it is possible to create models without prototypes in the past or analogues in the present.

Emphasis on the past was the “axiom” of pedagogical activity: textbooks, teaching aids, state educational standards, programs, etc., which are guided by “established” knowledge and other similar information products. If over 95% of knowledge contain information about the past in contemporary science (and mean first of all social sciences), the “educational knowledge” increases this percentage almost up to one hundred.

Schematizing, we can say that in most of cases the teacher was “a transmitter” of outdated information to students, while students were recipients of this information, which they had to memorize.

Of course, such a scheme of the pedagogical process is very rough and simplified, but it is important to show that such a scheme did not focus on the main components of the human mind but not on those of its functions that should be developed in the process of the formation of man and his consciousness. Indeed, Aleksey Ivanitsky said, “the basis of consciousness is the idea of renovation, which gives highest meaning to life and determines the constant human desire for novelty” [Ivanitsky, 2004: 720]. Contemporary education, focusing on the past and memorization of it, is detached from the creation of the future and this contradiction must be solved on the way of adaptation of innovative education to the future.

This means that during the further development of innovative processes in education it is appropriate to eliminate significantly temporal asymmetry of past and future in relation to the present and to start formation of consciousness of man in a different direction.

Focus on the past in education and other sphere of human activity is “temporal strategy” of model of unsustainable development. This temporal focus was manifested in preferential formation and existence of means and mechanisms for conservation and storage of information, without which biological and social organisms cannot exist.

If learning of the past was based on memorization, the inclusion of innovative and proactive modelling in the process is based on the principles of more creative process of developing education. In my opinion, proactive education, which was proposed for the implementation of the principle of temporal integrity, was the core of education in the interests of sustainable development.
Temporal integrity and futurization education

The process of futurization of education consists of two important components, happening in the education and in its relation to other areas of human activity. Let us start from the latter relation. In order to implement the transition to sustainable development, during several generations at least it is necessary to form the consciousness of people, accepting noospheric idea, implementing new civilizational strategy, and anticipating the consequences of their decisions and actions. Such anticipatory consciousness (noospheric) is necessary to be formed not only because sustainable development in its global implementation is possible only in the future. This is due to the fact that as mentioned in the publications, a global catastrophe (or series of them), which may happen in the 21st century, won’t enable mankind to eliminate the consequences of it, as it is done now, when local disasters, emergencies happen, and then their consequences are eliminated.

As already noted above, global (and primarily anthropoecological) catastrophe can be prevented only by proactive actions, because there will be nobody to eliminate its consequences. Therefore, knowledge and understanding of the need of prevention of catastrophes and skills of anti-crisis management in order to avoid occurrence of irreversible cataclysms, which are disastrous for humankind must be included in the education. It is possible, if innovative anticipatory noospheric consciousness, formation of knowledge about the future and the ability and willingness to proactive actions will be rapidly formed in education, being the most effective means.

Now we can come to the conclusion that education for such a global process as sustainable development will have to develop not only more rapidly than contemporary education, but also significantly anticipate other forms of activity, on which it has significant influence, orienting them on implementation of the model of sustainable development. Dynamism of futurization of innovative processes in education must be significantly different by its pace from modernization of education (although it is formed on its basis). In case of futurization, normative part of the study of the future should significantly influence on it, because this part will be the basis of formation of education for sustainable development. However, this does not exclude, but also involves a search part of the study of the future, because only in this way other more effective ways of survival and further progress of humankind can be found. Now it is clear that the transition from modernization to futurization of education is not just a theoretical fiction of individual scientists, but it is the imperative of time, without which the survival of humankind in the form of its transition to a sustainable future is simply impossible.

Futurization of education is a necessary component of the transition to education for sustainable development (ESD). ESD is not just a new field in contemporary education and not even its modernization. ESD in its developed and holistic form is a fundamentally new form. If you wish, it can be called a radically different type of innovative education, which fully corresponds to evolutionary ontological approach to education. Indeed, in this case formation of man, which is carried out with the help of ESD, will be fully included in the ontology of the process of transition to sustainable development.

However, during the formation of ESD anticipatory processes cannot be reduced just to a more rapid and accelerating process of taking a priority place by education (with science) in civilizational transition process to a new evolutionary strategy. Processes of futurization must occur in the content of education, when this content will be more and more filled with “innovative future”. Contemporary education even in terms of accelerated development of
innovative processes and modernization in it still remains very conservative system, mainly
due to the dominant ideology of learning to fundamental educational knowledge, which even
because of this interpretation shouldn’t be new knowledge at the same time.

Emergence of anticipatory mechanisms and forms in innovative educational process
is caused primarily by accelerating of process of aging of as scientific, as also educational
knowledge and acceleration of generation of scientific (and technical) information. According
to estimations of experts, working in the information field, doubling of the scientific and
technical information now happens less than for a year, possibly even for ten months (although
doubling of all information, not just scientific, takes just a few days, taking into account
contemporary global communications and especially Internet). This requires, of course,
replacement of outdated technologies and means, forms of scientific knowledge, functioning
in the sphere of education (educational knowledge on new more contemporary forms (on what
“smart education” is aimed), but also simultaneously generation and implementation of other
ways of transformation of this knowledge and means of knowledge.

Among these methods, which should be in focus of teachers-innovators, synthesis
and interdisciplinary synthesis and fundamentalization of scientific knowledge, which is
“implemented” in the educational system and functions here for a certain time. Moreover, the
reason is obvious: more general and fundamental knowledge becomes outdated much slower
and therefore it does not require additional educational and methodical work. However, it is
hardly possible to restrict solutions just by synthesis even of general scientific knowledge
and fundamentalization of knowledge and it is necessary to make a positive innovative
movement from “imperatives of modernity” on the way of futurization of education as general
civilizational process and formation of innovative anticipatory education (but certainly not in
the direction of the postmodern, randomizing future and present).

Proactive education as a kind of “top” of innovative aspirations in education should involve
such a new content, which will appear only in the future, but will be generated only by virtual
computer ways and proactive modelling, which will have conceptually theoretical or information
computer forms. The property of anticipation in innovative educational process will mainly be
concerned with goals and content of education and to a certain extent organizational status,
role of the whole process of learning and education among other areas of social activity. If the
transition to sustainable future depends on the new type of education, then legal, regulatory,
managerial, and organizational methods and forms should legalize functional role in the society.

It is quite clear that no matter how education was modernized, no matter what innovative
processes filled it, essence of upcoming transformations is not in this. The main innovative
process, which should cover all the world education in general, is in its futurization (both
associated with globalization) and display of all currently existing and possible proactive
factors and mechanisms. This will ensure temporal integrity of the educational process [Ursul,
2005; Ursul, 2008a], which is now significantly disrupted by focus of teaching activity on the
past. However, restoration of the temporal integrity of education will be accompanied by its
globalization and the emergence of global education.

It is appropriate to introduce a special principle of “temporal study” in any field of scientific
and educational activity — a principle that connects not only the past and present but also the
future in one global systemic temporal whole. Thereby interrelation between temporal worlds is
formed, where not only a linear relation, but nonlinear interaction of periods is

Temporal integrity implies that what we call time connects all three modes of temporal
worlds (periods) — past, present and future in a single (linear or nonlinear) system. When
analysing the role and interconnection of all three temporal worlds (past, present and future) in most areas of social activity in the contemporary unsustainable development, including global processes, attention is drawn to clearly set asymmetry or inequality. This inequality is that science, education is focused on the past and present, and the future is on the periphery of our attention and interest. Of course, depending on the type of activity proportions of temporal worlds (i.e. past, present and future) are different. However, the fact that the future is not in “favor” is obvious and many activities, including scientific and educational, show neglect of the future in the current model of unsustainable socio-economic development.

As also noted above, education, anticipating many activity-related processes in the formation of man, during formation of sustainable future must be developed more rapidly in all respects (particularly in terms of financing and provision of other resources) than all other forms of social activity. In this perspective education won’t just translate from generation to generation already significantly outdated knowledge for decision-making, but will also contribute to better understanding of the need for anti-crisis actions to move to sustainable development. Only proactive innovative education of sustainable development will become an integral component of human activity on the survival of civilization and conservation of the biosphere. However, this feature of anticipatory education will be the most obvious and, so to say, lying on the surface of the process of formation of education of sustainable development. Basic and profound essence of the model of “sustainable education” still is in the emphasis on the issue of the future in the content of education of sustainable development.

It is appropriate to say a few words about the education of sustainable development and anticipatory education. It is quite obvious that they are different types and forms of innovative processes in education. Anticipatory education includes futurization and proactive mechanisms for any options of vision of the future, not just normative sustainable development.

In this sense, it can be used beyond the education of sustainable development and in any other discipline, course and field of education because this is an innovative process, which is focused on the future. In this sense a special anticipatory education such as, for example, environmental and economic types of education cannot be.

However, if there is a science of the past — history, there are sciences of the future — futurology, prognostics and other forms of study of the future, which may be included in the educational process as something temporally symmetric to traditional historical approach, significantly supplementing it and implementing the principle of temporal integrity.

Futurization of all education can be in significantly increased attention to the future in all possible subjects and fields of the educational process. If this field of futurization coincides with the introduction of sustainable development in education, then it will be “sustainable futurization” when, as stated in the UNECE Strategy, there must be “the acquisition of knowledge by teachers, allowing to include issues of sustainable development in their disciplines” [UNECE Strategy, 2005].

Conclusion

At this stage it is most important to include issues of social development to all courses and educational disciplines, what happens in EU countries and other countries. Such inclusion, as well as the formation of special areas of education of sustainable development (innovative diversification process) means that proactive education of sustainable development will be implemented. This process was significantly intensified, when in June 2012 UN Conference
on sustainable development was held in Rio de Janeiro. Many higher education institutions made commitments regarding practice of provision of sustainability according to this and subsequent Conference. ESD proved to be one of the key mechanisms for achieving the Millennium Development Goals, as well as 17 new global sustainable development goals that were adopted at the Summit on sustainable development of the 70th UN General Assembly, adopted the agenda of sustainable development up to 2030.

To some extent, the emergence of anticipatory (as noospheric) intelligence for the whole civilization will continue the process of cephalization, taking the baton from biological and social evolution, using the latest information technologies. Due to proactive collective intelligence civilizational process will be adapted to sustainable future and the natural environment, providing further secure evolution of global space system “man-society-nature.” Educational process, which is still focused on the formation of individual, to some extent spreads on more extensive — supraindividual sociosystems, being included in integrative information structures of noospheric intelligence and the process of creation of sphere of mind and in perspective in creation of noospheric global space socio-ecological system. There is expected unification of learning and education as important subsystems of future noospheric intelligence into one holistic system.

References


