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Problems of the Interaction between Science, Education and National Security

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Abstract: *The paper presented discusses the poblems of interaction between science, education and national security in the East-european countries being in transition. National security is regarded in wider aspect, including elements of the economic, informational and ecological stability of a country.*

On the basis of data from advanced countries, Russia and Bulgaria, some inferences are made about the status of the scientific-educational complex in them and its direct or indirect influence on national security.

Some considerations are given about the ways of increasing national security in the different groups of East-european countries.

Keywords: *scientific-educational complex, national security.*

In the last decades it became obvious that there exists close connection between science, education and national security, which plays an important role in ensuring the necessary level of national safety and defense of the scientific-educational complex (SEC) itself. SEC determines the intellectual potential of society and is an essential factor for its development.

The notion "security" is defined as status of defense of the life-important interests of the personality, the society and the state against internal and external dangers. When defining the security problem the traditional notion "state security" is expanded taking into account not only the state interests, but also those of the person and the society, and some non-military threats – economic, information, etc. are included as a destabilizing factor. As a rule the part of the scientific-educational complex is not sufficiently explained in the existing documents, it is even neglected in some way. In reality the status of SEC influences the possibilities of the society and the state to protect themselves and the people against any dangers.

A formal graph model can describe most generally the interaction between science and education within the frames of SEC. The main task of science is reduced

to creating new knowledge I, on which the Universities are also based – I_1. The task of the education is to create qualified staff K, including the scientific sphere as well – K_1. Two flows I_2 and K_2, which characterize the contribution of University science to common science and the participation of researchers in specialists teaching are considered in the pair "science-education".

In this case SEC can be interpreted with the help of graph $G(N, U)$, containing four nodes

$N = \{I, K, H, O\}$, where H denotes science and O – education.

The set U_1 of four arcs is included in graph $G(N, U)$; $U = U_1 \cup U_2$ with the corresponding direction

$$U_1\{(H, I), (I, O), (O, K), (K, H)\}$$

and the set U_2 of two edges

$$(H, O) = U_1 \text{ and } (H, O) = K_1 .$$

Two features have to be noted when regarding the interaction between SEC and national security: first of all, the inter-type character of SEC, since it determines the development of all kinds of national security (economic, defensive, social, information, ecological, etc) and second – SEC is the basis for formation of society morality and culture.

Without science and high-qualified specialists it is impossible to establish scientifically based policy in the area of national security. SEC guarantees the mere fact of existence and stable development of the state. It is a bridge between the present day and the future. It is appropriate to quote the following statement of the ex-president of USA concerning the position of science and education: "we have many universities not because we are rich; we are rich because we have many universities."

It is very indicative to consider the triple connection "SEC I – Techniques T – Production P".

The experience of scientific-technical progress enables the definition of the following regularity: for the sake of efficient development of economy the tempo of technologies and techniques development has to exceed the tempo of production growth and science has to surpass the growth of techniques in its progress.

The relationship mentioned can be illustrated by the ratio:

$$\frac{dI}{dt} > \frac{dT}{dt} > \frac{dP}{dt},$$

where t denotes time.

Undoubtedly humanity is at the initial stage of information society development. It is characterized by the fact that information is the basic strategic resource of state and that the information technologies, closely connected with SEC, have significant role in economy structure.

The knowledge and high technologies, realized on the basis of SEC determine the future not only of economy and the corresponding safety levels, but also the development of absolutely all spheres in society. That is why the notion "knowledge based society" is used for information society. Science is the main source of knowledge. The thought of Acad. Moiseev, that "The power of the state in the new age will be defined not by "Snickers" and "Pampers", even not by electronics production, but by "ideas production", is unquestionable.

In the cold war period the orientation of science and education towards the problems of defense and security of the East-European countries was a distinct tendency. A large military-industrial complex (MIC) has been founded, based on the fundamental and applied science, actively supported by the state, as well as on specialized research organizations.

The problems of interaction between science and national security are very often engaged with natural and technical sciences only, paying the greatest attention to the problems of economic and defensive security. One of the key problems of national security in every state is the search and formulation of a national idea, i.e., of such a system of values, ideals and moods in society, which is the ground of patriotism, citizen responsibility and desire to preserve the country in a stable condition. The solution of these problems can be accomplished to a great extent by the humanitarian and social sciences, which gain more importance in the last decades. As an example many ethnic problems of national security can be pointed out. Their solving is quite complicated and contradictive and requires complex approach from different positions. Many humanitarian sciences must be attracted for it – sociology, law, history, psychology, etc.

The considerations above mentioned prompt that starting from the interests of national security and the preservation of the existing state organizations in a stable status, it is necessary to actively support and aid science and education. Unfortunately, in the countries of the former Eastern block (including the Russian Federacy), there exist opposite tendencies. There is serious decrease of the scientific-technical potential, of the educational level and the society intellectual potential also.

Many factors cause the negative tendencies in SEC, their basis being the financial inconsistency of many research organizations, the neglecting of the investigations results in local industry, the alteration of the image and prestige of the work in the scientific-research and educational spheres. The financing of science in RF has decreased more than 20 times in comparison with 1990. In $US expression the operating costs for science in RF are almost 100 times smaller than in USA. As a result of this, the researchers occupy one of the last places among the employed in economy with regard to salaries level. The equipment basis in most of the institutes, which has not been updated since a decade, is unsatisfactory. The expenses for information services, scientific exchange, etc., are insufficient.

Some indicators and criteria can be introduced for formal estimation of the security level of science and education. They can be the common expenses for SEC development and their structure, the investments in research and design activity, the status and application of the scientific-technical and innovation personnel, the staff and its structure, the correlation of the average salary in SEC with respect to the common for the country, etc.

It is assumed in world practice that if the operating costs for science do not exceed 2% of the gross internal product (GIP), then processes of science degradation begin. In RF this percent is below 1% at the beginning of the 90-ies.

It is accepted that the efficient development of economy requires the part of the export of high technology production not to be less than 10%-15%. This part does not exceed 1% in RF and in Bulgaria.

Some characteristics of the interaction between SEC and national security in the countries from the former Eastern block have to be taken in mind. These problems can be divided conditionally into three groups depending on the ways of their solution. A significant part of the East-European and the Baltic countries connect their future with the Euro-Atlantic structures and the guarantee they provide for their national security. The second group of countries are these from RF – no clearly determined strategy concerning SEC and the national security exists in them. The RF is in a separate group since it develops and realizes strategy of independent assurance of SEC and national security development. These three groups possess different historically based aspects of the interaction between SEC and the national security.

As a conclusion it should be noted that each state government in the globalized complex world has to define explicitly and exactly the degree of development of its SEC so that it will guarantee the minimal admissible level of national security, which should not be broken. The practice of the Balkan Peninsula in the last decade shows that otherwise the risk of destabilization in state structures is too high and there is a danger to be unable to guarantee the required safety of the person, the society and the state.

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Проблеми на взаимодействието между науката, образованието и националната сигурност

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(Резюме)

Разглеждат се проблемите на взаимодействие между науката, образованието и националната сигурност за източноевропейските страни в преход. Националната сигурност се разглежда в по-широк аспект, като в нея се включват елементи на икономическата, информационната и екологичната устойчивост на дадена страна.

На базата на данни от развитите страни, Руската федерация и България са направени изводи за състоянието на научно-образователния комплекс в тях и неговото пряко и косвено влияние върху националната сигурност.

Изказани са съображения за начините и пътищата за повишаване на националната сигурност в различните групи източноевропейски страни в преход.