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EDUCATIONAL INTEGRATION FOR POST-GRADUATE TRAINING (PGT) SYSTEMS IN THE FIELD OF NANOTECHNOLOGY: THE CASE OF KAZAKHSTAN

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Abstract

The aim of the research is to develop the theoretical and methodological bases for the educational preparation and integration of Master's and PhD students in the field of science-intensive industries (nanotechnology in particular). The phenomenon of educational integration is caused by global tendencies in the development of knowledge and technology as a whole. As nanotechnology is not a prerogative sphere of a single State but rather a field for humanity, both the training of specialists and their integration in this field are not only relevant but inevitable. Solving the task for the Kazakhstani system of postgraduate training, orientated at integration, would allow Kazakhstan to narrow the gap with international-level education in this sphere. Moreover, a new type of mindset with a greater ability to adapt to ever-changing trends could be achieved. Enriching itself with new knowledge, participation in solving global scientific problems and creating new scientific and educational products based on integration would become the concrete objective of Kazakhstan's postgraduate training system. The theoretical basis of integration processes occurring between the subjects of integration in PGT system rests upon the analysis of this particular type of integration.

Introduction

In modern days it seems impossible to reach a higher level of development without taking into account the already accumulated global experience and active participation in the integration processes. This is why one of the key strategic priorities of the development of higher education in Kazakhstan is the integration in the global system of higher education and science, which is directly linked to the country's competitiveness. Such an integration based on a deeper and expanded cooperation, in line with state

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interests, akin to a "highway to the Future"[1], could lead to significant changes in the educational and scientific potential of the country as a whole, influencing the development of nearly all spheres of activity.

However, integration processes are characterized by a high level of uncertainty as a result of numerous, often contradictory, external and internal targets for the development of the subjects of integration. The existing diversity of economic and societal development of the participants in the integration process often makes difficult to cooperate without drawing up appropriate structures and institutions, as well as creating a scientific basis in order to develop it further. Hence, the question which arises is that of thorough methodological development of the phenomenon of educational integration in order to weigh up the relations between the subjects of integration in their interactions and influences, a question upon which the objective of this research is centred around. The objective of this paper consists of developing theoretical and methodological bases of educational integration from the perspective of preparing Master's and PhD students in science-intensive industries (nanotechnology in particular).

1. Justification for educational integration in the PGT system

The analysis of relevant publications shows most researchers agreeing on the fact that integration is the leading tendency of world development. As for our research, numerous publications clarify this global aspect of educational integration, notably the globalization of educational systems in different countries (Horvath and Mihai 1991). The common view is that educational integration is overwhelmingly considered through the scope of the organization of the educational process and the improvement of learning techniques.

For instance, Vikashkumar (2005) looks at Information and Communication Technology in education in developing countries "to establish a ground for technology integration in education", and highlights "various ideas and insights on planning this integration process. The author also recommends "what can be done in the context of developing and poorer nations…" (J Vikashkumar, 2005: 468).

Naturally, it is generally difficult to perceive an integrated world educational space, harmonized at the organizational, technological and research levels, for the simple reason that economic and political

[1] Nazarbayev N.A. Speech by President of the Republic of Kazakhstan - the Leader of the Nation Nursultan Nazarbayev at a meeting dedicated to the 20th anniversary of Independence of the Republic Kazahstan.15.12.2011 http://www.akorda.kz/ru .

infrastructures in various states differ markedly and have their own particularities.

Yet, it seems possible to us that the integration develops in a separate sector of education through the creation and the development of integration-specific structures (unities), based on finding commonalities and patterns. It is hence relevant to draw an analogy with the economic integration, addressing the well-known work of Balassa (1961), who suggests "the inadvisability of integration sector by sector", which "had already been commended in the interwar period" (B Balassa,1961: 183).

Yet, as the author notes "this conclusion does not mean, however, that integration in one sector may not be beneficial, if political obstacles hinder integration in all areas. The European Coal and Steel Community from 1951 onwards is a case in point. … The Community demonstrated the possibility of integration in Europe, thereby contributing to the establishment of the Common Market in 1986" (Balassa, B. 1961, p. 185).

Scientists in Kazakhstan, while developing key scientific schools in nanotechnology, assert that today nanotechnology is the "main instrument of expansion of new markets", an "important object of cooperation" and the "focus of integration" (Ergojin et al. 2010). Consequently, we suggest that the same way as the coal and steel industry was crucial for the economic integration of Europe, nanotechnology may be one of the main objects of integration in Research & Development in the modern world.

Thereafter, education, PGT systems in particular, as direct projection of nanotechnological activity, has integrative potentials. The possibility of integration development of Kazakhstan's PGT system is determined by the greatest potential for integration into the international educational space. The possibility of educational integration in our sector of research (PGT) is determined by:

- the need to join international efforts in studies of complex problems of wider practice (in nanotechnology in particular);
- the existing general laws of development of education, science in the modern world;
- comparable properties and similar interests of integration subjects that allow integrity, working as a part of the overall educational space.

In addition, the current level of development of Kazakhstan's economy dictates that the preparation of highly skilled specialists of global standard in science intensive industries constitutes a special interest of the government. The country has taken a firm direction towards innovative development, related to moving away from being a resource economy, which would mean the priority of science-intensive industries, including nanotechnology. But there is still a gap with developed countries and there

exist limited proposals of high-qualified competitions for Kazakhstan's specialists.

So, considering integration as one of the main avenues for achieving the qualitative preparation of Master's and PhD students, we naturally focus our attention on the wide interaction, in education, with international collaborations.

Only the most economically-progressive universities, which eventually determine the educational policy of the whole country, could actively be involved in such integration processes. The process of reducing the number of institutes of higher education which do not meet the high standards of international education has thus begun in Kazakhstan. Solely Universities that fit into the international requirements and are actively involved in integration initiatives can provide high quality education along world standards.

In fact, the work of universities aimed at integration processes inadvertently changes the status of educational institutions as a category.

2. Research aspects of educational integration in the PGT system

In the context of this study, devoted to the training of highly qualified specialists in the frame of an integrated international educational space, certain *aspects of study* were highlighted. These are based on the idea that the development of educational integration and the analysis of research should focus on the following topics:

- comparative research of regularities and peculiarities of national systems of domestic PGT for building an institutional framework of international interaction;
- comparative analysis of the functioning of advanced training systems in the field of high-technology programs, providing the ability to integrate in conditions of corresponding experiences;
- practical uses and advantages of integration processes (design of integrated educational programs, joint research projects, etc.).

This research has established criteria of integration development, which contain the following elements:

- the degree of integration into the global system of education and science, which is associated with the expansion of scientific, educational and professional components of the integrated parts (depending on the scope of integration of a certain space, expressed by a university's "entry" into international associations, its participation in international programs, its membership in associations, international accreditation agencies, etc.);

- the degree of integration cooperation by the establishment of integration infrastructure (centres, departments. organizations), the increase of scientific and educational potential through effective research, conducted by the participants in joint ventures, diversification of curricula, courses, disciplines;

- the change of the nature and content of training as a result of new holistic quality exigencies.

3. Concepts and terminology used in this research

Theoretical developments of aspects of the educational integration under investigation should be based, primarily, on a clear interpretation of concepts and terminology used in the research. So, in the context of this research, it is necessary to clarify the meaning of such concepts as "*educational integration*", " *object and subject of integration,*" "*integration process*".

Since the notion of "educational integration" is generic with respect to such terms as "*education*", "*integration*", etc., it is necessary to proceed from them, while interpreting their meaning.

The notion of "*education*", according to classical definitions, refers to the process and the result of systematic assimilation of knowledge and skills[2].

The notion of "*integration*" has various definitions, depending on the scope of its applicability.

Their main common point, however, is to understand "integration" as the process of joining different elements, thereby creating complex and integrative qualities.

Generally speaking, a broad understanding of the phenomenon of integration, in the educational sphere also, is laid in the Kazakhstani Constitution[3]. The Constitution refers to "the respect of principles and norms of international law, policy cooperation and good neighbourly relations between States" (Article 8), and affirms "the right of the citizens of the Republic of Kazakhstan to freedom of association, regulated by law" (Article 23).

For our research it is important to understand the fact that the international institutional system is always adding new meanings to the process of integration, including education, continually expanding and deepening the concept. Therefore, with the development of relations between the education systems of different countries, the meaning of the concept of educational integration is continuously being updated.

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[2] *Great Soviet Encyclopedia*, 1969-1978, Soviet Encyclopedia, Moscow.
[3] *The Constitution of the Republic of Kazakhstan*. http://www.constitution.kz/.

In this regard, the concept of "*educational integration*" as "*coexistence, cooperation in various forms of education, based on interaction of regulated entities, which results in a new quality*" is our interpretation in this stage of study. The central notion, "*interaction*", requires cooperation within the functioning of the system. That is not simply to suggest a set of connections between components and the interconnection and interpenetration of the components but, moreover, the *integration* of the system as a result of the deepening and expanding of partnerships.

The concept of *educational* integration is very close to that of *pedagogical* integration, which means integration in the field of pedagogical knowledge as "a kind of scientific integration in the framework of educational theory and practice", even if, naturally, "such integration will have its own, pedagogical principles, forms and methods" (Bezrukova, 1996: 27).

The concept of educational integration is studied here in a broader frame, including the development of relationships between subjects of integration at the global level, in the field of international cooperation. In this sense, pedagogical integration is considered as part of educational integration. This interpretation of the concept of educational integration is required if it is to be used as a methodological research tool, enabling us to perform a content analysis of the integration phenomenon in the context of integration of PGT systems.

Furthermore, for our analysis, the following concepts should be specified:

- *the object of integration* - in this study, it is the PGT of Kazakhstan, as well as the entire set of forms, means, conditions for the educational integration, including organization and functional structure, information, knowledge and technologies in the field of nanotechnology;

- *the subject of integration* – represented by the participants of scientific and educational activities, such as: students in PGT system, teachers, researchers, staff, etc., as well as educational institutions (universities, colleges, training centres, etc.) interrelated around the world;

- the object and the subject of integration, forming *an integration system,* that is the *integration processes* itself, carried out by the different mechanisms of interaction, communication and cooperation.

4. Integration in the field of nanotechnology and PGT of Masters and PhD students

The educational space, in which there is an effective exchange of knowledge and successful experience, has global characteristics, affecting

all spheres of cooperation within the development of the integration processes.

In some respect, globalization in science and, respectively, in education is inevitable because the knowledge industry and the activity consisting in the production and transmission of this knowledge is basically universal and common. In the context of our research concerning a PGT system in nanotechnology, we proceed from the following postulate: nanotechnology is not the sphere of a single State, but a field for all humanity. So, integration in education for this area becomes urgent and the analysis of integration processes in nanotechnology-training is based on the following rationale:

- the development of nanotechnology is basically realized through the same objective laws in all countries;
- the development of science is oriented towards state and social purposes;
- integration processes provide the broadening and deepening of relationships and opportunities for research and education.

In Kazakhstan, a number of 90 projects have been performed within the scientific and technical strategic Program entitled "Development of Nanoscience and Nanotechnology in the Republic of Kazakhstan 2007-2009". In this program have been involved 30 organizations and agencies, including 9 universities. This program was designed to establish scientific and educational centres in leading universities of the country.

Agreements on cooperation with major foreign universities have been signed. However, "to provide any research in nanotechnology is not possible without training local staff, susceptible to scientific principles and technological methods of nanoscience" (N Bekturganov, 2008). Moreover, "in the country there is no expensive equipment to conduct scientific research in this area, so scientists have to conduct research in the laboratories of Russia" (V Krasnov, 2007).

Educational integration is a necessary tool to ensure high quality of post-graduate education in the field of nanotechnology but there are disintegration moments. These include the following: a lack of systematic campaigns towards integration processes in the field of education (except for some random cooperation activities), the persistence of poorly developed integration structures, etc.

However, the "struggle" for integration and disintegration processes is a *driving force of* integration, which, nevertheless, is carried out at the university level, with the support of the government.

An example of educational integration in practice is the *University of Shanghai Cooperation Organization* - USCO, which consists of the union of the leading universities in five countries seeking integration (Russia, China, Kazakhstan, Kyrgyzstan, Tajikistan)[4]. In accordance with the Program of USCO, in 2010-2012, there occurred the first admission and training of Master's students in the field of nanotechnology. The Kazakh National University, named after K. I. Satpayev, was selected as the main university in the area of training. The University proposed to develop a Master program in the field of nanotechnology. The advantage of such an integrated unity in the field of education is the opportunity to expand the students' educational paths with the aim of obtaining a double diploma: the diploma of the university where students conducted their training plus the USCO diploma.

It is important to say that Kazakhstan enjoys the great interest and willingness of stakeholders (students, teachers and managers of education) to fully participate in such professional developments in scientific, industrial, educational processes at international level. It is not just a fashion, but an objective necessity dictated by the course of development as a result of Kazakhstan's entry into the world of educational space in accordance with the Bologna Convention.

5. Theoretical developments of educational integration in PGT system

For theoretical and methodological support of the educational integration in the field of nanotechnology related to Master's and PhD students' preparation, work was carried out in the following areas of research:

First, the *conceptual and terminological apparatus* used in the study was clarified: "educational integration", "the object and the subject of integration", "integration processes of interaction". The meaning and embeddable content in the *conceptual and terminological apparatus* used was mentioned earlier (see section 3, Concepts and terminology used in this research).

Second, the basic *principles* of educational integration that guide the way into practice were established.

In accordance with the second direction of the research, a number of principles were developed. These are the basis of educational integration related to PGT and they correlate with the principles of integration in the pedagogical, political, economic and scientific spheres. Their essence and

[4] http://www.eduweek.ru

realization is summarized in Table 1. The content of these principles is given below.

Principles of educational integration
Table 1

№	Principles	Essence of the principle	Ways to realize it
1	Social conditionality of educational integration	Social order for the development of integrated structures is determined by the needs of scientific and technological development of the country in view of global integration.	Agreements; treaties by partnership and cooperation (with preliminary identification of the conditions and peculiarities of regulation); study of possible fields of joint activity including the legal and economic issues, common prospects and creative activity by adaptation of progressive experience
2	System principle	System (complex) approach to the process of interaction	The finding of common interests of integration subjects, taking into account wide spheres of interaction; the development of real scientific problems and educational issues and ideas (including social, economic, research, technical, professional); the establishing of connection between content and procedural aspects of education, theoretical and practical training during the construction of new integrity
3	Person-oriented principle	Integration is of personal interest	The forming of personal qualities (responsibility, sustainability, curiosity, the ability to think broadly and analyze; creative and critical look at things, etc.)
4	Principle of continuity of	The connection of stages, levels, degrees of	The establishing of broad succession of integrative

	educational integration	integration process that is accompanied by gradual changes for effective development and cooperation.	initiatives at all levels of integration; the ensuring of integrity and succession in the solution of specific problems of science and education (during the development of educational programs and studies)
5	Consistency of integration activity	The combination of multi-level and diverse integration activity for optimal connections and relations and for harmonization of scientific and educational activity between subjects of integration	The correlation of the goals and objectives of national educational systems; rational use of laboratory equipment, techniques for solving joint research and study tasks; the coordination of actions to modify the content of the training, to reveal perspective tendencies, to harmonize educational standards in different countries
6	Cooperation principle	Purposeful integration activity by finding commonalities, interests in research, study, professional field; the deepening of knowledge and technology; the intensification of integrative bonds, academic mobility	Implementation of joint research projects, integrated forms of education; creation of research and educational associations
7	Efficiency principle	Achieving the goals of educational integration that are connected with the improvement of new knowledge, a real participation in major problems of the world of science, creation of new products based on interaction	The development of various integration ideas

Let us now turn towards the detailed analysis of the afore-mentioned seven principles:

1. *The principle of social conditioning* is based on a social order for the development of integration structures and is determined by the country's needs for scientific and technological development in view to global integration.

Authors of Kazakhstan's initiative in nano-electronics, during the process of determining ways to develop nanotechnology, note that:

"first, it is necessary to depart from social order, considering the long-term perspective, but not opportunities and interests of separate research schools" (Ergojin et.al. 2010: 35)

This implies that there is a legal basis for the deepening and expansion of cooperation in the international educational space, which involves agreements, partnership, and cooperation treaties for the implementation of specific tasks in a common educational space. Such agreements are usually established following the already-existing contract-documents signed within the framework of political and economic integration of the country. The agreement may be drafted at the governmental level as integration initiatives of partner universities, in accordance with the Constitution of the Republic of Kazakhstan.

But in any case, the development of the integration documents is based on a preliminary identification of the principles, conditions and characteristics of the regulation of interaction. Therefore, integration steps should begin with a study of the possibilities of joint activity, including legal and economic issues, overall prospects for the development and creative activity by adaptation of progressive experience.

In accordance with the principle of social conditioning, the efficiency of integration is ensured through the connection of integrative tasks with the public interests, its ideology and politics.

2. The *System principle* results from a general scientific principle of universal communication and unity of the world. It suggests a complex approach to the processes of interaction within integration systems. The basis of this approach consists in common interests, ideas, scientific and educational issues, including social, economic, scientific, technical and professional.

The *System principle* in the context of educational integration also involves connection of the content and procedural aspects of education and the relationship between theoretical and practical training in the construction of a new integrity, which combines knowledge and technologies of activity of the participating subjects of integration. The

more integral the integration system, the richer the content of knowledge and technologies of activity, because the needs for integration subjects in the cooperation becomes higher.

The growth of PGT integrity is manifested in the relationship and the unity of the diverse functions - scientific, educational, professional, social, political - and, to a large extent, determines the effectiveness of the integration of the processes.

3. The *Person-orientated principle* means the personal interest of participants of integration that manifests itself in the direction of thinking to achieve global scale. This is caused by the fact that certain personal characteristics of participants of integration - responsibility, sustainability, curiosity, ability to think broadly and to analyze, creative and critical look at things, etc. - are required for the assimilation of the diversity of the contemporary world. Personal qualities are an internal factor in the interaction at integration level.

Thus, the educational experience shows that the most successful students are those who are capable to carry out research activities independently, on the basis of synthesis and analysis of knowledge, having a global thinking. These are students who tend to integrate forms of training and development of the specialty. Other members of the integration process must also have personal motives for their involvement.

4. *The principle of continuity* expresses the relationship between the stages of the integration process, levels of activity. With the implementation of this principle, destabilizing factors are minimized, processes of expanding of interaction forms and deepening of knowledge and skills flow smoothly and gradually, and undoubtedly influence the efficiency of development and cooperation. The principle of continuity is based on the following:

- wide communication of all integration initiatives implemented during the integration, in order to create a common space in which purposeful activity is done;
- comprehensiveness and consistency in the resolution of practical problems in a particular domain.

To create a common educational space, where integration initiatives can be realized, it is necessary to provide continuity of educational programs and training courses for all levels of graduate and doctoral studies. For the nanotechnology specialisation, there is a wide range of different disciplines that meet the needs of science and technology. The

problem of integration in this area is to adapt, diversify internationally through on-line communication and other technologies with continuity.

5. *The principle of consistency* of the multi-level and diverse integration activity suggests the establishment of optimal connections and relationships that involve mutual cooperation and harmonization of research and educational activities among the subjects of integration. For example, it is not always advisable to buy expensive laboratory equipment to conduct separate studies in case of presence of integration, which makes it possible to use the existing equipment of a partner's better equipped laboratory.

In addition, this principle allows considering and relating the goals and tasks of national education systems, to coordinate actions which change the content and also identify integration trends for the future. The introduction of this principle is needed due to the existence of specific education standards in different countries.

6. *The principle of cooperation* - similar to the principle of consistency - means the realization of integration based on the activity focused on finding common points of interest in the professional field, research, academic work, knowledge and technologies, intensification integrative bonds and academic mobility. Various forms and modifications of cooperation, such as joint-problem laboratories, workshops, module training programs, integrated disciplines, teaching methods, etc. are available.

An example of cooperation can be joint research projects, integrated forms of education, research and educational associations. The variety of integration forms in practice leads to a new quality of the community with single views, interests and approaches. This is possible in coherent coexistence and cooperation.

7. *The principle of effectiveness* is generalizing and consists in the achievement of the final goals of educational integration. One of them is the formation of an educational sector - PGT in particular - that can operate in active cooperation with international partners in the world's 'best practice', as well as the creation of conditions for greater interaction and cooperation, involving public instruments of influence. Achieving educational integration goals is accompanied by the implementation of the principle of effectiveness. More specifically, this principle means that all participants are associated with the following:

- Master's degree and doctoral students have the opportunity to study and work in a broad field of education, using their own knowledge and ability to reflect and analyze;

- teachers acquire new areas of professional experience and scientific potential based on emerging opportunities;

- a PGT system fills in the profile and educational activity with new contents;

- the government develops infrastructure as well as committees, associations, and it facilitates the effective implementation of organizational work in education.

In general, the implementation of selected principles aimed at the creation of conditions for self-assertion, self-expression of the subjects of integration at the level of professional, scientific, educational and social needs. The orientation on these principles contributes to the development of integration processes in the theory and practice of PGT system.

Third, *the structural basis of integration was* developed, which reflects the logic of educational integration and serves as a methodological guide for the identification of integrating potential subjects of integration as well as the practical implementation of integration.

For an educational integration that is to unfold in accordance with the above-mentioned principles there should be a *structural basis of integration* in the research system.

Since educational integration permeates all types of learning activities - academic, research, administrative, social, professional (that is, connected with the development of nanotechnology), there could be a range of possible impacts which ought to be anticipated before starting to develop an integration structure. So, logical-instructive structures can be a great help that is built on a clear statement of goals and tasks, relying on scientific principles and on level-oriented activity presented here with integration components, forms and specific functions (see Fig.1).

A description of the most common structural components of the logical and meaningful bases for educational integration involves:

i) the *aim of educational integration* - the creation of a scientific and educational community for the effective interaction and acquisition of a new quality of integrity and perfection of its components;

ii) the *tasks of educational integration* - aimed on forming such integration components and modalities for their implementation, functioning of a created community;

iii) the *principles of educational integration* are: system-based social conditioning, system-based, personal orientation, continuity, coordination, cooperation, efficiency;

iv) the *levels of activity* in the field of integration can be divided into :

- the theoretical and methodological levels associated with the development of scientific concepts and components of the logical structure (patterns, categories, concepts, principles, methods, ideas, and approaches);
- the practical level of organization and design of activity content;

v) the *mechanisms for the* implementation of educational integration: the adaptation of experiments, a transfer of components of activity, the development of forms and means of integration;

vi) the *components of educational integration*:

- knowledge in a particular area of activity (nano-objects, nano-structured materials, nano-technologies, etc.);
- technologies of research and educational activities (methods of obtaining nano-materials; research methods; development work on the equipment; teaching methods; etc.);
- educational programs, academic disciplines;
- areas of research, theory and practice;

vii) the *modalities of implementation* of integrative cooperation in accordance with different levels of activity:

- project-based learning, integrated courses, joint seminars, integrative learning technologies (forms of educational activities etc.*);*
- integration associations, unions, foundations, etc. – in brief: social forms of interaction - oriented to serve the purposes of joint education;
- joint research projects, research tasks, laboratory experiments, creative work, etc. (as a form of research activity).

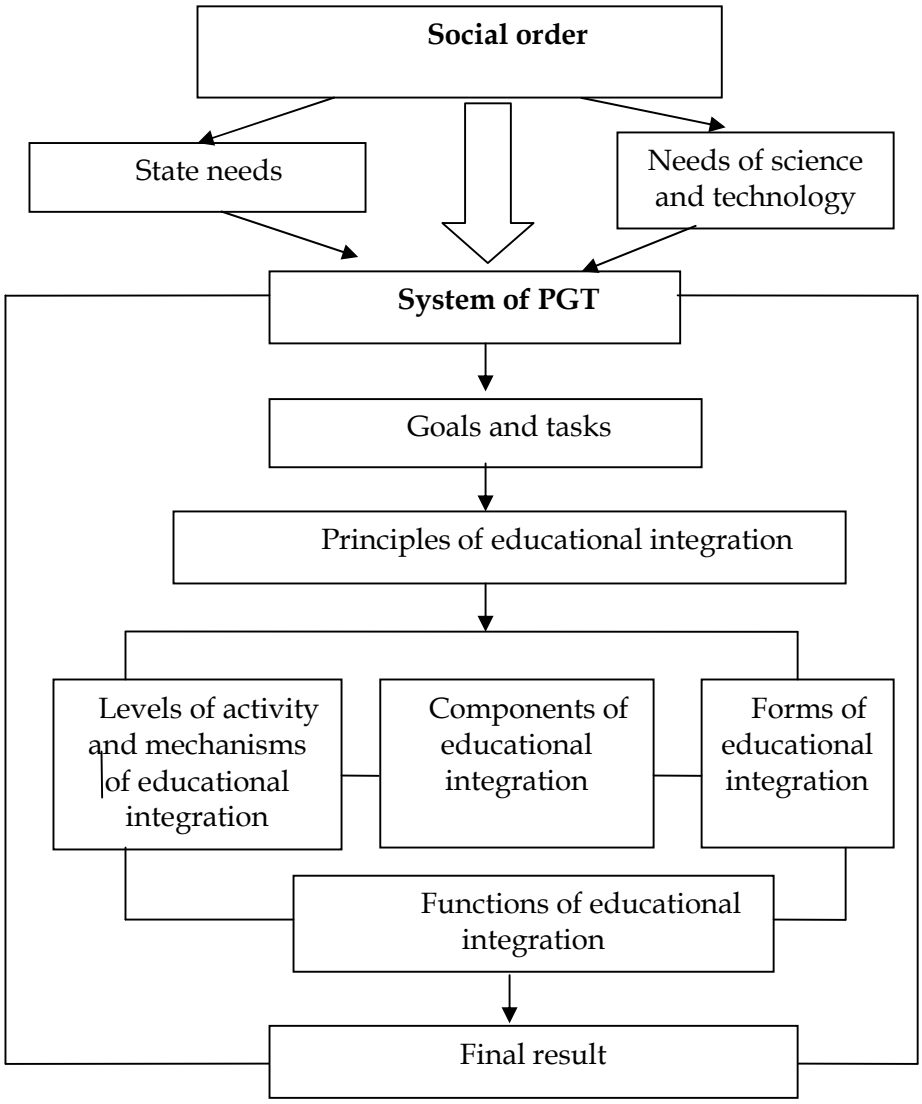

Figure 1: Scheme of educational integration in the PGT system

It thus appears that the wide the circle of participants of integration is, the more active forms of integration processes will occur. These processes are connected with the organization of educational activity and the determination of authorities of integration structures aimed at cooperation among the partner countries for the exchange of information, the expansion of scientific contacts, the distribution of publications, the revitalization of the education, for joint research projects, educational programs, and many others.

All in all, the *functions of* integration in education consist of the following:

- *theoretical* and methodological functions related to the content of the integration process and rationale of the integration form of teaching, research, and coordination of integration, development of structures, forecasting;

- *research* functions connected with problem-solving in the science of nanotechnology, the formation of complex issues and areas of activity;

- *technological* functions for the design and the use of new content in the training of specialists, strict methodical work to update existing curricula and the introduction of new ones;

- *information* and *communication* functions based upon the use of appropriate technology in order to guide and coordinate design-targets and to work together to assimilate information - in e-learning, for example;

- *developing* functions associated with the introduction of changes in the scientific and educational potential of integration subjects.

And so we believe that the theoretical understanding of educational integration with clarification *of concepts and terminology,* development of *principles for implementation*, drawing up of *a framework of integration* on the example of a particular branch of knowledge will further deploy practical action for the creation and the development of a combined educational and scientific space.

Conclusion

The presence of a developed theoretical and methodological analysis will make the practical part, at the integration level, more meaningful, and it will increase studies in nanotechnology, which have a great tendency towards the integration into the world scale.

Theoretical developments of educational integration in the PGT system for high-tech industries, nanotechnology in particular, allow researchers to analyze this phenomenon.

Based on developed principles of educational integration (social conditioning, system, personal orientation, continuity, consistency, cooperation, efficiency), this paper proposes a logical and structural basis of its implementation.

Such a *Logframe* includes the most important elements: goals and tasks; scientific principles; staged activity presented by integrative components, forms and functions.

The final result of educational integrity with effects on the quality of training will define Master's and PhD students who will be capable to solve global problems at international level.

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