INTERREGIONAL INTEGRATED SYSTEM OF EDUCTIOAL ESTABLISHMENTS: WAYS OF DEVELOPMENT

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Abstract: The topic under study is relevant, since we need to study new approaches to the development of integrative processes in education, which are of great interest for the development of the environment favorable for the creation and active use of innovations in the system of education. Therefore, this paper aims at revealing the principles and mechanisms of developing an integrated system of educational establishments in the interregional educational space in the form of a pedagogical cluster. We have used system, activity, and cluster approaches as milestones, ideology, and a method of our scientific inquiry. We have used theoretical methods of study for a system analysis of scientific and methodic literature, empirical methods, and a method of modelling, which implies the reproduction of properties, structure, and functions of the object under study on a specially elaborated model. The paper represents organizational and pedagogical bases for the development of an interregional cluster system of educational establishments. The materials of the paper may be useful for pedagogues in the organization of activity of cluster interaction subjects for providing self-arrangement and self-development of educational establishments in the interregional pedagogical cluster. **Keywords:** the creation of an interregional integrated system of educational establishments, the development of integrative processes subjects in education.

1. INTRODUCTION

Integration (as well as differentiation) of sciences is innate of any period of scientific studies; however, they were the most active in the post-industrial epoch during the development of economy based on knowledge. Today, the civilization movement clearly demonstrates a paradigm shift that involves the very perception of the world around. Such changes are largely stimulated by the achievements of modern technologies. The paradigm of education changes too, since there is a clear transition from a highly specialized system of education as a basis for industrial economy to an interdisciplinary system of education organization as a basis for transition to convergent technologies of a new technological type. The evolution of integrative processes in the world, regularities of development of particular regional integrative associations, the processes of globalization and regionalization are interrelated scientific issues with many modern interpretations.

The term “integration” (Lat. integratio – restoration, replenishment, from integer – whole), which reflects the association of elements in a whole that produces new cumulative properties, comes from natural sciences and is widely used in philosophy and socio-economic sciences. V.A. Engelhardt revealed the notion “integration” in the form of three stages of integrity achievement: a system of associations between parts occurs; the parts lose their original identification qualities when entering the whole; the occurring integrity acquires new properties conditioned by the properties of parts and new systems of associations between parts [1].

In the format of corporate management, integration is treated now as management of a special organizational system created by specialization, cooperation, and diversification of economic entities represented as corporate structures; besides, the participants of interaction should be flexible in responding the demands of market to enter new levels of development [2]. This implies the mobilization of resources of integration participants and the development of philosophy of corporate behavior based on observing corporate ethics, reputation, and knowledge.

International experience of management of innovative and scientific- technical development of regions shows that today, there is an objective process of synthesis of scientific, industrial, economic and social policies at various levels in the form of specific formations called innovative clusters for creating and maintaining the environment favorable for creation and active use of innovations in particular industries. The basis of such cluster structures is that its establishments support each other by their activity and receive synergetic effect from each other. Thus, the EU countries have three-level development of innovative policy with regional, national, and super-national components uniting all the countries of the European Union. Interestingly, a regional component mostly becomes structural instead of redistributive. Federal government has a priority in fundamental studies and staff training including research and innovations, while regions mostly pursue the policy of innovation distribution [3].

In strategic management, integration is represented from the viewpoint of diversification processes that transform particular establishments into integrated systems. Thus, A. D. Chandler notices that strategic integrative changes are often used in crisis situations: at particular stages of an economic cycle, in case of competition strengthening, for reducing costs and extending positions in the marker [4]. N.Yu. Konina assumes that all known waves of integration are generally associated with technological breakthroughs, industrial crises and rises, inflation, i.e. the periods of organizational rearrangement of economy and reassessment of its assets [5].

Therefore, we should note that the essence of integration is mostly manifested through:

1) the establishment of associations between isolated elements of a system;

2) deepening, enhancement;

3) the enlargement of the number of associations and establishment of new associations;

4) the occurrence of new integrative (whole) properties in the system, the agreement of associations between enterprises, the change of a system structure.

I.D. Zverev was the first to study the potentials of using integration in educational process in Russian pedagogics. He described integration as a process and a result of creating the inseparably associated [6].

V.S. Bezrukova assumes that integration in the context of an educational system can generally be treated as:

- “the highest form of interrelation” with inseparability of various components, new objectivity, structure and functions of objects entering the association;

- “the highest form of expression of the unity” of all components, which define the content of education;

- the creation of large pedagogical units due to unity of interrelated components of an educational process. [7]

The analysis of scientific literature allows us to discuss three trends in defining the regularities of pedagogical integration in education according to:

a) the degree of coverage of integrative-pedagogical phenomena (general, private, particular integrative-pedagogical regularities);

b) the account for the degree of integrative element in them (potential, actualized and current integrative-pedagogical regularities);

в) analogies with available pedagogical regularities [8].

In most cases, the principle of integration in pedagogics is treated in two aspects.

First, it is a state that implies concordance, order, and sustainability of associations between various elements.

Second, it is a process that leads to this state.

Let us systemize possible trends of the development of integrative processes in education:

- to achieve corporate efficiency due to rational policy of management and improvement of intercorporate processes;

- to receive synergy by providing deeper specialization of educational processes. In case of vertical integration, the coordination in case of using low-cost highly specialized assets improves, while in case of horizontal interaction, transaction costs reduce. Therefore, there is an effect of scale. The modernization of a technical base and the update of educational programs result in innovative synergy.

- diversification or choice of trends in development. In case of long-term decline of demand, for example, on particular educational services, the competitiveness of interaction participants reduces. It is quite possible to focus on releasing new educational services more demanded in the market in a particular time due to diversification.

- the growth of management mobility due to a greater role of decentralized management through delegation of authority [9,10,11,12].

The efficiency of cluster integration in education is proved theoretically and confirmed by numerous foreign and domestic examples. The works [12,13,14,15,16] clearly show that various forms of network interaction including cluster interaction enable the participants of integrative processes in different countries to develop agreed actions and share the updated content, technologies and results of activity through Internet.

2. METHODOLOGY AND METHODS OF STUDY

We have used system, activity, and cluster approaches as milestones, ideology, and a method of our scientific inquiry. A system approach is necessary for studying cluster integration of educational establishments as a whole object, which is ordered and complex and consists of interrelated elements [17]. The priority is to reveal various associations and relations both inside the object under study and in its interrelations with external environment. We also bear in mind that the properties of an object as a whole system are defined rather by the properties of its structure and special cornerstone integrative associations of an object than by summing the properties of its particular elements.

New ways of organizing social activity of people and technology of co-organization become an important vector of development in a modern world. Therefore, the study uses an

activity approach, which is an important basis for creating the conditions for new conceptual representations of the ways of cluster integration development in the region.

The advantages of a cluster approach are the combination of diversification, functional concordance and legal independence of subjects of interaction as well as regions' interest in the creation of such integrated systems and giving various assistance in the organization and stimulation of development of cluster participants from state authorities and other structures: educational, financial and municipal [18].

3. RESULTS

We can solve the issue of the specialists training quality only if we use programs and standards that supplement and help each other. According to the principle of labor separation, each educational establishment as an important element in the system of a pedagogical cluster is intended to satisfy the appropriate share of social needs in educational services as fully as possible with the least costs of resources. Therefore, a pedagogical cluster may be defined as an institutionalized result of interaction between the subjects of educational activity. They have their own goals and, at the same time, are strategically interested in uniting into a cluster integrated system for increasing the efficiency of their own activity. The participants of interaction create a pedagogical cluster and develop a new organizational mechanism, which enable them to keep the status of a legal body and cooperate with each other for obtaining competitive advantages compared to other subjects of an educational sphere. The participants of cluster integration are still legally independent participants of the labor market. They have their own goals and rely on own interests and values in their activity. The cooperation with other participants of an educational market is explained by the opportunity to get additional advantages as a kind of system resource; in this case, the cluster develops itself through the involvement of new participants in the educational process. Therefore, a pedagogical cluster is a complex multidimensional network where each participant of interaction provides a certain system effect from its activity as a part of a cluster. Objectives of a cluster can be realized only if all the participants of interaction will strive for achieving an overall innovative educational product based on overall educational values.

Passing to the modeling of a cluster integrated system, we should note that in case of knowledge economics, the resources are mainly concentrated through the increased information flow circulating between the subjects of interaction, while the complexity of a cluster integrated system is defined by the number of associations between these subjects. Therefore, a cluster integrated system, which may have quite a large number of participants, seems a very complicated system with many internal cross associations that interact actively with external environment from the viewpoint of development of its model. Basing on the peculiarities and principles of network interaction organization [19,20,21,22,23] revealed earlier, we can describe the model of a pedagogical cluster developed within a framework of the study through a large number of elements. These elements include the destination and goal of creating a pedagogical cluster, basic principles of its development, functions, content of activity and technologies of creation and distribution in mass practice of collective educational programs based on system scientific and consulting support of the activity of cluster interaction subjects. The independent subjects of educational activity at various levels are the main elements of a pedagogical cluster. Educational core of a pedagogical cluster is represented by a large pedagogical university with a group of scientific and educational establishments, which support various stages of innovative and educational processes of creating an overall innovative educational product.

The interaction between the participants of a pedagogical cluster is based on some basic principles:

– continuity of education, arranged with account for pedagogues' career progress in the educational cluster;

– principle of consistency, which implies integrity, consistency and concordance of the actions by cluster integration subjects aimed at joint solution of their tasks;

– principle of autonomy, according to which almost all the trends of activity in the pedagogical cluster are provided by specialists from educational establishments - the participants of interaction;

- principle of integration, which implies the unity of efforts of network interaction subjects for achieving the identified goal;

- principle of cooperation, which involves the efficient use of internal and external resources of integration: staff and scientific-information potential of educational establishments, financing, private infrastructure, educational technologies, training equipment as well as the adoption of legal acts to define basic trends in the development of their cooperation;

– principle of development of integration participants, which implies greater competitiveness of particular participants of network interaction;

- principle of compatibility, which accounts for specific features and profiles of the establishments of general and professional education participating in network interaction for creating joint educational programs and systems of corporative study and organization of their direct participation in the educational process. Each participant of interaction should preserve certain freedom and, at the same time, stimulate the development of cluster integration;

- principle of collegiality, which implies collective responsibility of network interaction participants for taken decisions to avoid possible conflict situations;

- financial independence of cluster interaction participants due to state budgetary financing and on commercial basis including resources inside the system;

- openness to Russian and foreign citizens. According to this principle, educational establishments of a pedagogical cluster are open to everyone.

The organization of cluster participants interaction based on the principles above provides:

• continuous and multilevel professional pedagogical education;

• improved material and technical base of interaction participants;

• selection and structuring of the content of education with account for the interests of all the subjects of a pedagogical cluster;

•stimulation of professional growth of teaching staff in educational establishments;

• employment according to the specialty chosen with a clear perspective of career progress, which contributes to the development and improvement of professional competence of interaction participants;

• the increased level and diversification of education provided by educational establishments in the cluster [23].

Let us reveal basic functions of a developing pedagogical cluster:

- economic function associated with the creation of sphere of popular economic services, which satisfy the emerging demand timely;

- social function that provides guaranties for graduates from professional education establishments;

- marketing function that defines the trends of professional orientation work within a framework of a pedagogical cluster;

- legal function that provides the elaboration of a legal base of partner relations;

- pedagogical function associated with joint projecting of educational activity in training pedagogues;

- corporate function that provides the orientation of network interaction participants on general values and interests;

- prognostic function aimed at improving the philosophy of interaction depending on the change of social request by society;

- information function that provides network interaction participants with new quality knowledge, which rapidly becomes out-of-date.

We underline that the stability of cluster relations within a framework of a pedagogical cluster is mostly provided by monitoring of productive development of particular participants of integration. In this respect, the function of monitoring in a pedagogical cluster is directly associated with tracing the results of cluster interaction, revealing the satisfaction of parties with achieved effects and readiness to prolong the agreements made.

Actually, the organizational structure of a pedagogical cluster is only a subjective way to integrate particular educational processes: crosscutting curricula according to the participants of a cluster and their functional units (departments, laboratories etc.). Cluster functioning is a unique targeted process that is difficult to forecast (stochastic process), where a cluster transforms from one state into another.

Management of a cluster is based on the study of influence of various external and internal factors on the indices of an educational process and correct regulation of these processes for achieving required efficiency of the entire system functioning. An algorithm for a cluster integrated educational system is represented in the fig.1.

A pedagogical cluster is created in the Institute of Management and Law of Ural Pedagogical University (Yekaterinburg, Russia). Based on the provisions above, it unites now a number of general education establishments of the Sverdlovsk and Kurgan Oblast, some higher education establishments including Ural State Pedagogical University, Kurgan State University, Moscow Social-Pedagogical University (Russia), Osh Humanitarian Pedagogical Institute (the Republic of Kyrgyzstan), and scientific centers of the Russian Academy of Education. In other words, we can treat it as interregional and international already at the initial stage. The institute of Management and Law is a core of cluster integration. It performs the functions of a network interaction coordinator and represents an educational research platform for providing the interaction between participants.

It is important for the organizational-structural model of a pedagogical cluster offered and implemented in USPU:

- to create a quality system of management, which provides due efficiency of managing cluster innovation activity throughout all its trends;

- to have an updated model of a specialist in education based on the development of professional competences, which enable to correspond to elaborated qualification characteristics of traditional and new pedagogical professions;

- to have a developed system of criteria for evaluating the results of activity of all the participants of a pedagogical cluster; together, they create a special environment, which enhances motivation of students for professional training and increases the labor potential of academic staff;

- to reveal basic priorities of development including:

• to provide the educational system in the regions of the Ural Federal District with staff basing on scientifically justified forecast of the needs in the territories;

• to prevent misbalance in the educational and labor markets, to monitor constantly the supply and demand for specialists and educational services provided by them.

• to modernize the system of pedagogical education management, to agree educational policy and control over its realization in the establishments of various status; to provide management activity transparency and recognition of its efficiency by the subjects of interaction;

• to pay special attention to content, structure, new technologies and organizational forms of training masters of education and the enhancement of their motivation for scientific and innovation activity [10].

We know that the specifics of a pedagogical cluster as one of the forms of social partnership needs a new mechanism of participation of regional authorities in the creation and implementation of the strategy of its development. In our case, the main objective of authorities is to make integration more attractive by developing interactions for a multiplicative effect of transfers of innovative educational technologies and raising competitiveness of educational establishments inside a cluster through the increase of the quality of telecommunicate infrastructure and specialized service. Besides, they should provide productive competitiveness in educational technologies and knowledge and increase professors' professional competence.

We should note that at the initial stages of creation and development of a cluster integrated system, the interaction of subjects in this system is more controllable, since we see no stable agreement of positions of interaction participants at this period, while there is a need for interaction. At the stage of self-arrangement, the sustainability of interaction based on mutually reinforcing cooperation is provided.

The development of specific educational organizations-participants of interaction within a framework of a pedagogical cluster has the following sequence:

• to define the mission of an economic entity during integration;

• to assess a current state of an educational establishment;

• to study and assess the external environment of an economic entity;

• to make a managerial analysis of strong and weak points of an educational entity;

• to analyze strategic alternatives;

• to choose and implement the optimal strategy of development;

• to monitor the results of a chosen strategy of development.

4. DISCUSSION AND CONCLUSION

The strategy of development of a pedagogical cluster is defined by a number of economic, social, and pedagogical factors. The economic objective of a cluster is to create a competitive system of regional professional education for successful development of a system of regional education in general. The cluster is the only whole system; therefore, a Coordination Council with all concerned participants of cluster relations is created to provide interaction. Such a council performs the function of a coordinating center responsible for taking important strategic decisions.

Social responsibility of a pedagogical cluster is to give guarantees of employment to graduates in compliance with their profession, area, specialty, and qualification.

A pedagogical factor is mostly manifested in joint creation of an overall innovative educational product by all concerned parties, which involves the development of the content of education, the creation of new competences in graduates, the update of the organization of on-the-job training and probation of professors, further training and requalification of specialists.

The development of a pedagogical cluster is largely supported by regional authorities by both direct and indirect methods, which gives a pedagogical cluster so called impulse of development. Thus, such support provides the elaboration of corresponding target complex programs of development and promotion of a pedagogical cluster, the introduction of stimulating measures for attracting investors, the increase of motivation of the cluster subjects for joint activity in certain perspective directions etc.

The growth of positive effects of a network interaction is defined by multiple relations, the fullest possible use of available resources and associations of the participants of a cluster integration, the support of regional authorities and a coordination center (coordination council of a cluster), which reduces the risks of integration for participants. Possible additional profit of educational establishments obtained through enhanced interaction on the conditions of mutually reinforcing cooperation in the format of corporate interests is a quantitative criterion of the interaction efficiency [24, 25, 26, 29, 27, 28].

Now, the efficiency of a pedagogical cluster is treated as a manifold phenomenon. On the one hand, it is manifested by the reduced costs of updated educational programs, less social tension and new jobs in the region, investment attraction etc. On the other hand, in case of integration, the competitiveness of educational establishments grows, labor conditions become better, the quality of provision by professional pedagogues grows, infrastructure improves.

The basic indicators of the effect of introducing a pedagogical cluster in the educational practice involve:

- greater share of overall innovative educational products issued by cluster participants compatible in the educational market;

- activation of methodic, scientific and innovative activity in a cluster;

- smaller gap between the number of specialists graduated from the educational establishments of the cluster and the need for these specialists in the labor market.

Therefore, a pedagogical cluster may be defined as an institutionalized result of interaction between subjects of educational activity, which have their own goals and, at the same time, are strategically interested in uniting into a cluster integrated system for increasing the efficiency of their own activity.

Successful development of a pedagogical cluster will be largely defined by:

- joint use of knowledge and basic funds including the reduction of costs of material base, infrastructure, information supply, training and retraining pedagogues in new technologies for educational and innovative activity;

- better competitiveness of all cluster participants due to implementation of new educational technologies.

- faster exchange of information and contact establishment, simpler access to new educational technologies, higher efficiency of knowledge transfer processes, the use of intellectual, material and information resources in training pedagogues and conducting research activity;

Main advantages of a developing pedagogical cluster involve:

- the creation of a real instrument of interaction between educational establishments of a pedagogical cluster and a labor market;

- the improvement of staff infrastructure of the regional education;

- contributing to the creation of favorable innovative climate for the regional system of education in general;

- the development of innovative activity infrastructure;

- creation of a natural base for module and mobile principles of education, which implies gradual refusal from subject teaching and enhancement of interdisciplinary associations;

- the provision of open educational process, which allows a learner to create an educational route independently as a subject of market relations in accordance with his personal wishes in the scale of the entire pedagogical cluster;

- high intellectual producibility of education adapted to personal peculiarities of learners.

Further development of integrated structures of a pedagogical cluster implies wider local network interactions inside a cluster due to the development of:

- infrastructure by improving the level of service, creating conjugated facilities in compliance with the level of interaction participants' equipment;

- information networks through the improvement of a single information field for educational cluster subjects;

- consultation networks to raise staff qualification and specific training of specialists.

In general, the key features of network interaction in case of a pedagogical cluster are widening information and education space that enables to describe various horizontal and vertical interactions in a cluster; information that reveals the content of these interactions; and time that shows the logic of network relations development. Innovative behavior of cluster interaction participants, the ability of pedagogues to interact efficiently in the situation of uncertainty becomes the main results of innovative educational projects within a framework of a pedagogical cluster.

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Fig. 1. An algorithm for a cluster integrated educational system in a region