



The Formation of Cluster Systems of Education in the Russian Federation

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ABSTRACT

If we assume that the cluster is an organizational form of uniting the efforts of stakeholders towards achieving competitive advantages, the combination of entities should be based on complementarity of intellectual, infrastructural and material resources. The modern world functions and develops in several interrelated, interdependent and interrelated planes (directions), which are called media: Ethno-religious, cultural, moral, socio-political, industrial-technological, economic-labor, geopolitical, etc. Each environment can be considered as a holistic system, if it includes some required components. Localization and physical infrastructure create the conditions for the existence of the environment. The content and process define the scope of human existence, which is specific to your environment. Information and methods of communication (the full details of the two previous components) to provide individual environment for each person. This component of the environment is a kind of field, making it accessible and connecting with other mediums. In the framework of the education cluster may be a system of national priorities of the Russian Federation, to determine the sequence of emergency stocks, will be finding the most cost effective ways of solving environmental problems, which is especially important in the conditions of rigid financial policy. Coordination of the joint efforts of all actors and components of the educational cluster – guarantee of successful solution of tasks of federal importance in Russia.

Keywords: Resource Management, System Management, Cluster, Educational Cluster

JEL Classifications: I21, I25, I28

1. INTRODUCTION

Considering the impact of the cluster approach to the emergence of new forms of economic relations in the sphere of education of the Russian Federation it should be noted that the advantage of cluster approach is that it makes significant a number of educational organizations (in some case, we can say business structures, because the educational institutions that gain to come from professional activities), united under a single aegis, but also attaches importance to social and regional aspects of development. This approach encourages regional development, increasing employment, improving the competitiveness of the region, the growth of regional and local budgets.

Theoretical and methodological basis of research were works of domestic and foreign scientists on the issues of cluster leadership and sustainability of educational systems in the region. Instrumental-methodological apparatus: In the justification of theoretical propositions and findings the study used general scientific and special methods approaches: Systems approach, methods of the expert and logical analysis. When solving individual tasks were used correlation and regression analysis, and statistical methods and tools for visualization.

Information and the empirical base presented statistical data of federal and regional bodies of federal service of state statistics of Russia, by results of researches of domestic and foreign scientists,

published in monographs and scientific periodicals, as well as information provided by the regional management system.

2. DISCUSSION

Differentiation and individualization of professional education are prerequisite for the integration processes, one of which is the formation and development of educational clusters. In the near future a major role in ensuring sustainable competitiveness of the national economy will play just cluster policy development. The formation and development of regional clusters is estimated as an important competitive advantage in the modern economy, providing substantial synergies as the basis of regionalism in the global economy. In accordance with the findings of M. Porter on competitive advantage (Porter, 1990), clusters reflect the trend to integration and socialization of the economy. Those regions, which are formed and operate in clusters, become leaders of economic development.

The most common form of business associations in the modern Russian economy are holding companies. Holding companies have a special role in the formation of the budget of the country.

Therefore, exploring new forms of economic relations formed through the cluster, we consider it necessary to consider the process of formation of a holding clusters combining of the holding company as a conglomerate of different legal entities and cluster technologies, created on the basis of the knowledge spillover from one company to another.

Large enterprises education cluster holding structure allows substantially increase their assets, increase capital investment, optimize taxation with the subsidiaries using in-house tools.

Despite this, Russian legislation lacks legal regulation of activities of cluster holdings. In this regard, we believe it is necessary to consider various definitions of the concept of “holding” in the Russian legislation, types of holdings, as well as the advantages and disadvantages of the cluster holding the model of business organization in order to continue to offer the most optimal form of cluster formation at the regional level (Table 1).

Recently in the Russian holding companies is a conglomerate of enterprises of commercial structures in which the relations between

Table 1: Definition of “holding” and its relationship with the development of clusters

The essence of the definition of holding	The connection of the holding structure with the cluster with the positions of various sources
T. Kashnina: Holding, from her point of view, it is “not so much voluntary, many forced union corporations in order to not divide and to survive and maybe even improve their competitiveness” (Kashnina, 2003)	The education cluster is a concentration of the most effective and interrelated economic activities, i.e., a set of interrelated groups successfully competing firms that constitute the “Golden section” in the western interpretation of “diamond” of the entire economic system of the state and ensure a competitive position in the industry, national and international markets A cluster is a group of interconnected enterprises and associated institutions in a particular field that are geographically close and related by some commonality or complementarity
A. Ivanyuk: The holding company is an Association of legal entities in which holding company by virtue of participation in charter capital of business companies or non-profit organization carries out control over other members of the holding company in order to conduct a common economic policy to achieve one or more goals common to the entire group (Ivanyuk, 2005)	The cluster is a community of firms, closely related branches, which are mutually promoting growth of competitiveness of each other
I. Shitkina: Holdings... are a type of group of individuals, based on relations of economic dependency and control, which, while maintaining the legal autonomy in its business activities are subject to one of the band members, which, by virtue of owning controlling shares (participation shares in charter capital), agreement or other circumstances render a decisive influence on the decisions other team members (Shitkina, 2003)	The term “cluster” indicates a sectoral and geographical concentration of enterprises that produce and sell a range of related or complementary goods with joint efforts
V. Shuvalov: A holding company is a legal entity, which by virtue of predominant participation in charter capital of other business entities (participants of the holding) or in accordance with the contract or otherwise has the ability, directly or indirectly (through a third party) to determine the decisions of economic entities—participants of the holding (Shuvalov, 2003)	
K. Portnoy: Holding is a group of persons including the parent company (holding company) other companies in respect of which the parent company has the ability to determine decisions taken by them (Portnoy, 2004)	
I. Shitkina: Holding form of business Association, representing a group of entities (participants), based on relations of economic dependency and control, which, while retaining the formal legal independence in its business activities are subject to one of the band members—holding company (parent organization), which, being the center of the holding enterprises, because of the predominant ownership interest in the share capital, contract or other circumstances directly or indirectly (through third parties) has a decisive influence on the decisions other team members (Shitkina, 2006)	

the management company and subsidiary, are governed not only and not so much the right of ownership or participation in the charter capital, how many by means of certain forms of contractual relations determined by the current legislation (Zakharov et al., 2016; Arzhakov and Silnov, 2016).

Based on the above, taking into account the analysis of Table 1, we propose the following definition of a cluster holding.

Cluster holding is a group of economically interacting legal persons are concentrated, in contrast to the “classic” holding, in the same geographic territory, with a homogeneous industry affiliation, in which the share of the parent company (the cluster core) does not provide full control over the activities of other participants of holding.

This definition reflects very well the basic idea of establishment of the cluster type: Cluster holding should facilitate active reallocation of funds between businesses with the aim of financing major investment projects and transactions and knowledge flows which are possible as a result of the exchange of experience and technologies within the cluster.

In scientific literature it is noted that any cluster goes through a number of stages. They may not be identical, and the rate of their development can vary, but there is an internal logic of the way in which clusters develop, which makes it possible to distinguish some characteristic of a model cluster. Even though the precise shape and direction will depend on the specific circumstances, the cluster goes through the following life cycle stages:

1. Agglomeration. In the region there are a number of companies and other actors.
2. Emerging cluster. Some participants in the agglomeration start to cooperate around a core activity and realize common opportunities through their linkage.
3. The developing cluster. Arise or involve new participants in the same or related activities in the region, there are new relationships between all of these new players. Can appear formal and informal institutions sustain cooperation. Often begin to have names, websites, general content related to the region and activity.
4. A Mature cluster. He has reached a certain critical mass of actors has developed ties beyond its borders, to other clusters, activities, regions. There is an internal dynamics of the creation of new firms through their formation of a joint venture by the department.
5. Transformation. Over time, markets, technologies, and processes change, as well as clusters. For a cluster to survive, be sustainable, avoid stagnation and decay, it is necessary to produce innovations and to adapt to changes. It can choose the form of transformation into one or several new clusters that focus around other activities or simply to change the ways in which supplied products and services.

It should be noted that the distinguishing feature of the cluster is the lack of a single legal entity, it is more consistent with the model holding type. The cluster is not a single economic entity.

Strategic planning of cluster development in some cases is carried out in accordance with a specific scenario (in the case of

active participation in the development of the cluster authorities). Quite often the joint planning of economic activity by groups of economic entities, temporarily uniting for the implementation of joint projects.

It should also be noted the obvious difference in the terms “cluster” and “industrial park,” “Technopark,” “industrial district” and some others, reflecting mainly structural features. The concept of “cluster,” in addition to structural characteristics, primarily reflects the functional characteristics – the current system of relationships: Cooperation, transaction, competition, exchange of information, etc., At the same time, industrial Park or Technopark can be a “core” of cluster, industrial district can be formed by the clusters, proto – clusters and sub-holdings.

2.1. Institutional Imperatives of Applying the Cluster Approach in the Education System

Reflecting the need of functioning of integrated structures through the establishment of enterprises of the cluster type, we should look at the effectiveness of their activities, in order to prove the possibility of developing more flexible forms of integration.

Ambiguous attitude to the problem of creation of economic clusters existing today in the scientific circles of Russia, and requires in-depth study of scientific approaches to this economic phenomenon in the framework of the new concept of competitiveness, considering the possibility of establishing a qualitatively new integrated structures aimed at implementation of innovative and investment component of economic policy and practical transformation of the mechanisms of state regulation of integrated systems at regional level.

According to research by the founder of the cluster approach to the theory of competitive advantages of M. Porter, “Firms in industries with clear competitive advantages within the country (or internationally), usually do not haphazardly scattered across the country, and tend to concentrate in the same region of the country” (Porter, 1990).

Position M. Porter competitive firms are spreading their influence on the market actors with which they interact: Suppliers, consumers and competitors. In turn, the competitiveness of these firms has a beneficial impact on the operations and status in the competitiveness of the company leader.

The result of such interaction is the formation of the cluster, that is the community of firms, closely related branches, which are mutually promoting growth of competitiveness of each other. Separate clusters contribute to the competitiveness of individual industries of the region to domestic and international markets.

As noted above, the interaction between cluster members happens through the exchange of goods, technologies, information, services, etc.,

Clustering involves conducting a series of studies at the regional level, which primarily relate to the determination of competitive advantages of the region in a particular area of production.

So, from the perspective when analyzing the functioning of the cluster in the region is necessary to assess the degree of development of integration and cooperation processes, processes of formation of effective owners, the level of innovative development; readiness to work in a growing cooperation and competition in the interests of dynamic development of business and territory, the level of economic activity of the population, the structure of exports and imports of goods/services, income levels and other indicators.

Creating a cluster involves the passage of five stages: Preparatory, analytical, strategic, implementation and planning of future development.

With this purpose it is necessary to identify the underlying companies (the leading companies), to identify key partners, identify regional opportunities (terms of supply of production factors, their quality and degree of specialization (Kobersy et al., 2016; Kunelbayev et al., 2016); competition and strategic development; demand conditions; related or supporting industries), to identify priority markets.

The basic definition of the enterprises included in the cluster will have a key influence on the efficiency of its functioning as a whole. In this regard, it is necessary to perform not only their current operations and prospects for the coming years.

In our opinion, the use of such a typology of territories and businesses is a factor of the information-methodological support of the process of analysis of the efficiency of cluster formation, and also allows you to highlight areas that need priority focus and money on their development, reserve areas and areas where the development of a particular industry is inappropriate; to define the priorities of specific companies, to implement public policies directly associated with the development of the sector and overall socio-economic development of the region to tolerate the experience of industry development from one area to others with similar conditions to differentially relate to the sectoral specialization of individual regions.

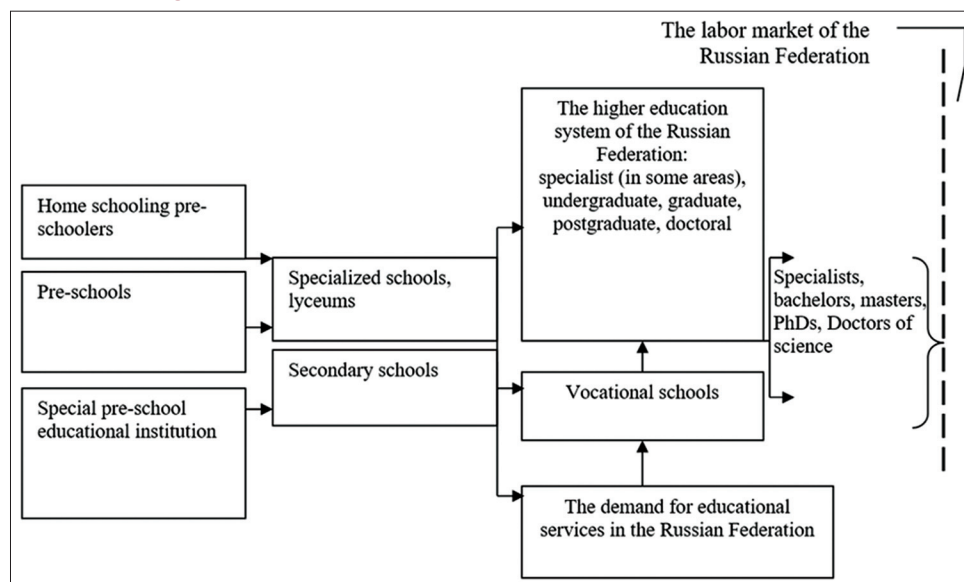
Considering the mechanism of management of enterprises of the cluster type, it should be noted that it creates the conditions for innovative development on the basis of the cyclic changes of time and resource characteristics of the business processes increases the predictability of results by time, is provided “starter” competitiveness as the ability to align the strategic plans with the requirements of the target market parameters.

2.2. The Model of Structure of Educational Cluster in Russian Federation

Analyzing the proposed model in Figure 1, we can say that the most efficient, innovation-oriented is seen merging into the general education system, science and industry (associations, companies, enterprises), through the formation of clusters, the undoubted benefits which include:

1. The reduction of the mismatch occurring between the labor market and market of educational services, through the establishment of partnerships in the system “education-science-production;”
2. The system “education-science-production,” being a continuous process, provides a sustainable interaction of elements that allows the cluster to quickly navigate the changes in the space of market relations;
3. Educational clusters are effectively used internal resources; personnel, scientific and information potential, finance, infrastructure;
4. Association to the cluster, on any grounds forms not spontaneous concentration of various scientific, technological and educational innovations, and a certain system of distribution of new knowledge production and educational technologies;
5. This forms a multi-level system of education allows to deepen and expand knowledge to future professionals for the work (organization, company, enterprise). To apply for their innovative training methods, the characteristics of that particular production (organization, company, enterprise) that will allow to increase the compliance of the graduate production requirements (organizations, companies, enterprises);

Figure 1: Model of structure of educational cluster, Russian Federation



6. Through the integration of teaching content, the implementation of the principle of continuity in the purposes, methods, forms and means of training, reduced time for training new personnel;
7. The trainees, as subjects of the process, focusing in the space of the system “education-science-production” can choose opportunities to expand their knowledge and career growth that eventually will lead to the increase of labor productivity at the enterprise (organization, company, manufacture);
8. The formation of mechanisms to encourage employers (industries, organizations, companies, enterprises) cooperation and investments in educational institutions and science.

Thus, the control mechanism cluster, the built-in process of innovative-technological development of enterprises creates the conditions for the predictability and the controllability of the parameters of innovativeness of the product and its successful market promotion on various factors. The synchronization process is governed by the mechanism of launching innovative solutions at the specified cycle during the transition of project tasks in a workflow system of the organization activities.

This reduction of development time of innovations is ensured by the synchronization stages:

- The synchronization of the transition from phase to generation phase of the adaptation project is implemented by methods of parallel implementation of scientific and technical programs, creation of telecommunication networks for bringing together in a network of development companies in the form of science parks, and technology. Conducted joint R&D creates innovation infrastructure, including international integration, the vertically integrated clusters. If this solves the problem of creating conditions for the functioning of international innovative clusters as an element in the mechanism of innovative entrepreneurship;
- Synchronization management decisions during the transition from the adaptation stage to the stage of commercialization of the projects is implemented by methods of the so-called lean manufacturing and provision of innovative product value for the consumer taking into account the targeting of products, environments, services at all stages of the product life cycle;
- Synchronization during the transition from phase to commercialization phase of the modernization project is implemented by means of reengineering, continuous improvement, orientation, market demand for innovative, high-tech products, the creation of channels of communication producers and consumers, continuous monitoring of the technical parameters and characteristics of innovativeness of products/services.

At the same time constructive management of potential cluster requires active intervention of the authorities interested in increase of efficiency of economy of the territory (Abankina et al., 2016).

In some cases, effective cluster development requires little effort (trigger – effect), others require the implementation of large-scale projects (Novikov et al., 2015). Economic policy aimed at supporting clusters of companies, significantly different

from policies aimed at supporting the separate core businesses. Selective methods of state aid and state support to give place to general measures of infrastructure development clusters. For clusters it is the presence of infrastructure – including specially trained staff, adapted to the needs of the cluster the industrial orientation of the channels, business cooperation, etc., – is a key factor of competitiveness.

The cluster approach, as international practice shows, not only serves as a means of achieving the objectives of the industrial policy (structural change, increasing of competitiveness, strengthening of innovative orientation, etc.), but is a powerful tool to stimulate regional development, which may ultimately be the improvement in the trade balance in the region, increasing employment, and wages, payments to the budgets of different levels, enhancing the stability and competitiveness of the regional industry. Policy support cluster should be implemented at various levels – Federal, regional and municipal, and politics at lower levels often has a dominant influence on the development of the cluster.

However, it must be emphasized that the effectiveness of any cluster project involves the interaction, taking into account the interests of many participants (Kosareva and Safronova, 2016). At realization of cluster strategy of development of areas of special importance (Oleinikova et al., 2016), the importance of awareness by firms of these features of cluster strategies within their own strategies.

State authorities at all levels (Federal, regional, municipal) can draw attention to potential dangers and opportunities, as well as in one way or another to support initiatives in this direction, to promote the development of infrastructure. It can also assist in eliminating barriers to cooperation, providing advice and disseminating best practices for the formation and functioning of cluster of industrial-innovation systems.

Businesses, in turn, must take responsibility for the processes that arise from these events, and their successful implementation. It also seems clear the role of public associations and unions of employers in the implementation of cluster projects in terms of infrastructure development of industry and support entrepreneurs, territorial chambers of Commerce and industry.

Thus, the implementation of an effective cluster project, before the authorities raises the need for a transition to significant changes in economic policy.

3. CONCLUSION

Currently, there is a need to conduct a binding assessment of the education sector with the labor market requirements and international standards. The needs of the labor market due to the peculiarities of development of the territory of the Russian Federation. The traditional activities of higher education have always been focused on total process Economics, operating in the industry. Existing conditions the region’s educational institutions industry profile has been centrally focused on staffing specific

sectors of the economy. These conditions resulted in a number of contradictions between the individual parts of the system of vocational education and regional structures. The collapse of the rigid vertical structures, the lack of strict employment distribution of graduates of vocational schools has necessitated the formation of regional labor markets and systems of education.

The consideration presented in the section of questions allowed us to make the following conclusions:

1. The creation of clusters in the system of education of the Russian Federation includes a number of studies at the regional level, which primarily relate to the determination of competitive advantages of the region in a particular area of production.
2. As criteria of the effectiveness of cluster management in the education system of the Russian Federation it is expedient to use the ratings of the financial condition of educational institutions, investment, corporate development, infrastructure development, development of human resource quality and resource availability of one or two key companies in the cluster.
3. Using a typology of territories and businesses is a factor of the information-methodological support of the process of analysis of the efficiency of the cluster formation in the system of education of the Russian Federation, and also allows you to highlight areas that need priority focus and money on their development, reserve areas and areas where the development of a particular industry is inappropriate; to define the priorities of specific companies, to implement public policies directly associated with the development of the sector and overall socio-economic development of the region, to tolerate the experience of industry development from one area to others with similar conditions; differentially relate to industry specialization of individual regions.
4. The management mechanism for cluster systems of education of the Russian Federation, creates conditions for the predictability and the controllability of the parameters of innovativeness of the product and its successful market promotion on various factors. The synchronization process is governed by the mechanism of launching innovative solutions at the specified cycle during the transition of project tasks in a workflow system of the organization of commercial activities.
5. Constructive management of potential cluster systems of education of the Russian Federation requires the active intervention of the authorities interested in increase of efficiency of economy of the territory.

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