

Cluster Approach to Network Interaction in Pedagogical University

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ABSTRACT

The study presented in the article is devoted to the analysis of theory and practice of network interaction within the framework of education clusters. Education clusters are considered to be a novel form of network interaction in pedagogical education in Russia. The aim of the article is to show the advantages and disadvantages of the cluster approach as theoretical and practical methodology for pedagogical education management. The following research methods are used to achieve the aim: content analysis of publications (articles, monographs, abstracts of thesis, etc.) and focus-groups. The results of content analysis are summarised into three groups of problems revealing different aspects of network interaction in pedagogical education. The results of focus-groups show experts' attitudes towards the ongoing processes of pedagogical education clusterization. On the basis of the study undertaken in the article the authors consider the perspectives of the cluster approach development in pedagogical education. In conclusion some topics for further discussions in this area are offered.

KEYWORDS

Network interaction, cluster approach, network forms of organization, education cluster, pedagogical education, Pedagogical University, Institutions of General Education

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Introduction

The question of how new forms and models of network interaction can contribute to improvements in teacher training has been extensively discussed in the professional community. A wide range of publications, quantitative growth of publications, and usage frequency of such concepts as "cluster", "network interaction", "network organization", "network form" indicate the importance of research findings generalization where scholars describe their theoretical views and experience in terms of professional and pedagogical clusters (Anderson, 2003; Meller & Raiala, 2003;

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Fedorov & Davydova, 2014; Fonseca, 2011). On the other hand, more frequent use of network models of cluster type in teacher education makes cluster research especially relevant today.

Content analysis of the main concepts ("network interaction in education", "education cluster", "the quality of teacher training", "regionalization of education") allows us to summarize the results of the studies connected with network interaction in pedagogical education (teacher education) based on the cluster approach. The article draws on publications (articles, monographs, dissertation abstracts) issued in the Russian Federation from 2005 to 2015. The literary review has enabled us to identify the key issues in network interaction in pedagogical education, combine them into groups, describe the main methodological approaches that are used by scholars, and reveal a potential for improving the quality of teacher training (Ahtarieva, Mokshina & Rakhmanova, 2015; Ostaszewski & Reid, 2010; Karbanovich, 2015; Prokhorova & Semchenko, 2015; Vinogradov, Panfilov, et.al, 2015).

Focus group methodology (Cohen, Manion & Morrison, 2000; Mayring, 2014; Nagle & Williams, n.d.) offers researchers a way to present a qualitative description of the problems and prospects of network models of pedagogical education, to justify their relevance to contemporary educational practice, and identify strengths and weaknesses for each of the stakeholders in professional and educational clusters. System description of implementation of educational network models in a cluster format allows for the conclusion that teacher training today is based on fundamental research, design concepts and innovative teaching experience.

Methodological Framework

Results of the literary review and content analysis of publications confirm the relevance of addressing the problem of network interaction in teacher training. Research materials confirm the fact that the realities of the 21st century schooling require teachers of a new type, a new generation of people with a high level of professionalism and education, global thinking and a moral conscience who are capable to implement the ideas of society–nature co-evolution (Davydova et al., 2014a). Accordingly, a specialist with these qualities can only be trained in such an environment where efforts of all teacher training members are integrated, i.e., through network interaction. A significant part of the reviewed materials directly points to the lack of (or limitation of) resources to provide high quality training of teachers that is also proven by a number of references to global trends of unification and cooperation in education.

Another important argument, confirming the relevance of the topic, is related to the issues of daily practices of general education and teacher education and to higher requirements for the quality of education. Today scholars more frequently refer to the competence-based approach which brings forth new goals in pedagogical education as well as analyze the peculiarities of teachers' professional work and conditions of teachers' training. One of these conditions is network interaction (Mozhaeva, 2014). There is a discrepancy between the needs of the educational community and the real quality of education of university graduates (educational outcomes of graduates). Researchers believe that a variety of models of practice-oriented teacher training may contribute to the solution of this problem. Above all, the practice-based learning model will aim at developing students' ability to project their future career in accordance with the rules that have been worked out by the professional community. Accordingly, this would require "increased hours of school practice, developed long-term in-service training and internship, which would necessitate organization of school-based teacher

training that would be difficult to achieve without establishing networking and school-university partnership (Guruzhapov & Margolis, 2014).

The main methodological approaches to network interaction in pedagogical education in Russia are of two types: systemic and cultural.

According to the authors of the reviewed publications, the systemic approach views networking as not just a sum of various resources. If we focus on methodological principles of this approach (functionality, openness, hierarchy, emergence, self-organization, etc.) we can transform their use to a new level and lend systemic properties to networking, thus providing solutions to a new class of problems that were not previously available. In turn, the cultural approach seeks productive use of the ideas of integration in education and culture. In particular, researchers note that integration trends determine the overall coordination of interests of stakeholders and create conditions for action in the field of innovation-based development of pedagogical education.

The theoretical foundations of the research are the theories and ideas related to different areas of scientific knowledge. For example, publications on network interaction in pedagogical education extensively use the economic theory of competition, where M. Porter (Delgado, Porter & Stern, 2010) first defined the term "cluster" as one of the basic concepts. This definition gave rise to numerous original interpretations of such concepts as "education cluster", "pedagogical cluster", "learning environment of cluster" and others.

The activity theory and ideas of pedagogical interaction, pedagogical design, socio-pedagogical partnerships, and continued pedagogical education also afford a basis for the development of network interaction models in education. Among theoretical foundations for networking are the concepts of professionalism, innovation, leadership, and leadership skills of teaching staff, as well as the concept of human environment of the educational institution as a basic condition for the realization of creative potential of individuals (Simonova, Minyurova & Rubina, 2014).

The most frequently mentioned principles that lay the groundwork for original networking models, are the principles of modularity, integrity and regionality. These principles take into account cultural and historical features of pedagogical education development, its traditions, etc.

The main research questions addressed by the authors of the reviewed publications can be classified into three groups. The first group of questions is related to the study of how the network members develop within the cluster and how to manage the development of network members (Davydova et al., 2014b; Karbanovich, 2014; Zalyalova, 2014). Researchers examine the motives of integration and reveal both external and internal factors that affect integration of network members and provide their overall development. The second group of questions aim at providing principles of network interaction. These are the principles of openness, flexibility, adaptability, consistency, accessibility, cultural conformity, and collaboration. It would be reasonable to include in this group the studies that seek for organizational forms and patterns of interaction. These are often forms of a professional and educational cluster which is seen as an integration mechanism for social partnership in university teacher education (Karbonovich, 2014). Questions of the third group are focused on maintaining a unified learning environment by creating well-developed network structures that consolidate all the stakeholders of pedagogical education in the region.

Methodology

Clustering as a basis for knowledge and technology sharing cycle management within a single system of teacher education is one way to improve the quality of training of future educators.

To date, the most widely used models are regional education clusters which include all sorts of educational organizations, and models of mixed type - "School-University-Institutions of Postgraduate Education", bringing together not only schools and universities, but also other education-oriented organizations.

Regional education clusters are based on a stable system of knowledge dissemination, innovative technology, a specific regional network of new experience transfer, which is based on traditions, contacts, and joint research. In addition, cluster members receive competitive advantages due to the possibility to provide regional specialization and standardization, and reduce the cost of innovation (Vinogradov, 2001). Omsk State Pedagogical University (OSPU) initiated establishment of a regional cluster of Professional Education, and this initiative was supported by the Ministry of Education of Omsk region because an innovative structure of this kind helps to solve social and economic problems of the region, expand cooperation and networking between regional educational institutions and create resource centers for applied skills. As of today, the cluster provides different solutions for education: models of higher, secondary and continued pedagogical education; a system for training specialists in education tailored to the needs of the labor market in the Omsk region; designing programs for applied bachelor degree programs; an integrated e-learning environment, aiming at training specialists of a new type, with a high level of competence in modern educational methodologies and technologies, etc.

Cluster "School-University-Institutions of Postgraduate Education" provides conditions for bridging school and university education with real life economy needs. This model aims to build a system of continuous professional training of school and university students and young teachers coupled with the active support of employers and strategic partners. A process of learning today is not confined within the school and the university, it involves a whole range of different social relations, creating a multi-dimensional educational environment within which school and university students have the opportunity to gain practical experience while solving professional and personal issues (Dmitriev & Verkhovskaya, 2013).

This model implies continuity of research and project-based learning activities of students. New conditions of integrated educational process contribute to unleashing the potential of different educational methodologies: project-based learning, problem-based learning, contextual learning, group learning, etc.

Within the framework of this model, in Omsk region, specialized school classes are going to be formed that will conduct targeted training of high school students who are going to get enrolled in the Pedagogical University.

In 2014-2015, in order to study cluster models in the system of pedagogical education in Omsk region, the authors have conducted 4 focus group sessions with representatives of administrations and teachers of university, colleges and schools (Makarova & Drobotenko, 2014). Each focus group consisted of 6-8 people. On the whole, 26 people took part in focus group sessions. Preparing and conducting focus group research were carried out in several stages (Gotlib, 2005). At the first stage, we formed groups of respondents and studied their readiness to participate in a discussion of prospects of cluster-based pedagogical education. At the second stage, we developed a program of focus group studies, defined objectives, goals, hypothesis and scenarios of the discussion. The purpose of the study was to provide a rationale for cluster-based pedagogical education, and the research aimed at revealing the problems related to

cluster organization and predicting outcomes of teacher training within a cluster environment. The hypothesis suggested that an integrated cluster environment will enhance the quality of professional teacher training. The scenario for the work of the focus groups was as follows: introduction to the problem, panel discussion of issues that were united in several units, individual assessment of the discussion (reflections in conversation and in writing), general summary of the moderator on the results of the group work.

Results and Discussion

Focus group sessions took place in different educational establishments of Omsk and Omsk Region (Pedagogical University, municipal schools of Omsk № 19 and 115, gymnasium in Novovarshvka and school in Lyubino). As early as at the stage of introduction to the problem, the participants began to actively speak out in favor of creating and implementing cluster models in pedagogical education, and expressed regret that until now such models have not been put into common practice.

Respondents' answers to the first series of questions concerning the benefits of clusters compared with traditional forms of professional teacher training afforded the following conclusions:

- cluster-based teacher training is more conducive to realization of the principles of practical orientation and duality of education through integration of university education programs with college education programs or specialized school programs;
- clusters expand professional orientation of students and increase their interest in teacher's career;
- clusters afford more opportunities for creative collaboration of researchers and scientists of various levels and generations in a format of lounges, salons, competitions, exhibitions, etc.;
- clusters provide conditions for taking into account the results of formal and informal learning;
- cluster environment contributes to greater variability of teacher training techniques and selection of individual educational trajectories, etc.

The second series of questions concerned the reasons why cluster models are not widespread. Respondents identified, among other problems, the need to match the interests and requirements of all members of the cluster, the lack of regulations of networking environment, the need for scientific and methodological support of cluster-based learning activities, unwillingness of teachers of universities, colleges and schools to work in a cluster environment, etc.

The final series of questions was devoted to the analysis of the possible risks that clusters can present for teacher education. The focus group pointed out that, on the one hand, a cluster is multi-dimensional educational environment that provides more opportunities to gain experience in educational practice and to understand the values of this profession, etc.; On the other hand, this environment limits students' opportunities to move to another professional community, or change career plans or individual trajectories of professional training. However, today, focus group participants see far more advantages than disadvantages in clusters and emphasize the need to build more clusters and implement the principles of cluster-based pedagogical education.

The results of the *focus group sessions* showed that 18 representatives of administrations and teachers of university, colleges and schools are supporting the idea of clusters in pedagogical education in Omsk region. 7 teachers of university and

colleges said that clusters is a good way for future teachers to get unique experience in teaching practicing not only at schools but also in colleges and other educational establishments. *5 administrators* believe in success of clusters in pedagogical education in Omsk region because cooperation of different educational organizations gives a whole picture of how to train teachers in our region. *3 school teachers* regret that there was no such a possibility to get such like experience when they studied at University. They believe that experience they could have acquired in different educational establishments at the stage of studying at University would give them some flavor when they were looking for work. *3 other participants* of the focus group sessions discussed the benefits of clusters in relation to remote schools in Omsk region. They underlined that clusters could help remote schools to attract young teachers after graduating from the University if students would practice at these schools while studying at University.

At the same time *6 other people* who took part in focus group sessions are not so optimistic about the future of clusters in pedagogical education in Omsk region. They doubt about effectiveness of such innovative ways to train teachers. According to their opinion, traditional fundamental pedagogical education based on knowledge is the best way to have qualified teachers. Different types of experience young teachers can get after University at the stage of internship and probation.

Thus, the results of our study showed some controversy on the questions of clusters in pedagogical education in Omsk region.

Conclusion

One of the major perspectives on further practice development of network interaction within the framework of education cluster (i.e. regional cluster of Professional Education in Omsk region) opens in the establishment of Pedagogical University Chairs at Institutions of General Education. In today's conditions of systemic changes in the sphere of education it is necessary to find new forms of interaction between pedagogical science and educational practice as well as to develop new formats of organizing scientific and methodical work (Vasilevskaya, 2007). The establishment of Pedagogical University Chairs at Institutions of General Education is supposed to become a suggestion for new challenges and it will provide schools with appropriate and timely assistance in their scientific and methodical work. This form of network interaction has some specific features and can be characterized as knowledge-intensive, mutually beneficial, practice-oriented and efficient. At the moment, Omsk State Pedagogical University carries out a project initiated by the Ministry of Education and Science of the Russian Federation (project 27.168.2016/HM "Pedagogical University Chairs at Institutions of General Education: New Format of Scientific and Methodical Work") and it is expected that the main outcomes will lead to the presentation of theoretical models of network interaction between Pedagogical University and Institutions of General Education, the creation of a legal and regulatory basis, the development of strategy and programme of work. Thus, network interaction through Pedagogical University Chairs at Institutions of General Education keeps a great potential for integrating pedagogical science and educational practice.

Network interaction within the framework of education clusters provides new impetus for improving the quality of educational services, increases the mobility of students and teaching staff, and allows for effective professional orientation of high school students. As a result, it creates conditions for improving competitive abilities of the younger generation for successful career building. Moreover, in a cluster-based collaboration, not just a group of professionals is formed, but we witness emergence of a significant community of university and school teachers, continued education trainers, and representatives of administration - intelligent people who are prone to

constant self-development, and who understand what results every interested party is expecting from teacher training.

There are still unresolved problems of network interaction in pedagogical education, for example, the lack of mechanisms for sharing of knowledge, ideas, experiences, best practices and technologies. Prospects for further study of network interaction in pedagogical education include the development of cluster-based training models that would take into account regional specifics, the needs of the regional labor market and the possibilities of all subjects of cooperation, as well as the network-based forms of teacher training in a cluster environment. The establishment of Pedagogical University Chairs at Institutions of General Education will supposedly become a new format of organizing scientific and methodical work within the framework of education clusters.

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No potential conflict of interest was reported by the authors.

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