



УДК 004.2

**POSSIBILITIES OF APPLYING THE NETWORK TECHNOLOGY FOR
MANAGEMENT OF EDUCATIONAL INSTITUTIONS
МОЖЛИВОСТІ ЗАСТОСУВАННЯ МЕРЕЖЕВОЇ ТЕХНОЛОГІЇ УПРАВЛІННЯ
ЗАКЛАДОМ ОСВІТИ**

Sas N.M. / Сас Н.Н.

d.p.s., a. prof. / д.п.н., доц.

ORCID: 0000-0003-0308-6092

*Poltava V.G. Korolenko National Pedagogical University,**Poltava, Ostrogradski St., 2, 36000**Полтавський національний педагогічний університет імені В.Г.Короленка,**Полтава, Остроградського, 2, 36000*

Abstract. *The author substantiates the possibility of using network technology to manage an educational institution. The author considers network interaction as a form of partnership - joint activities with a common goal and objectives with the pooling of resources to achieve them into a single mechanism. As a result, students receive an education using resources of several educational (educational, extracurricular, public) institutions. As there is no experience in the application of network technology for educational institution management, the author has identified and systematized such opportunities in managing a base educational institution. The goal of the study is achieved through identifying trends in the formation of theoretical generalizations regarding network management, network management experience, contributing and limiting factors to the application of network management of the base educational institution.*

Key words: *educational institution, network management technology, opportunities (institutional, theoretical, experience)*

Purpose/Objectives. It is known that the growth of the number of various available elements of the system (in our case - the educational institution) will increase the degree of its diversity, and hence - the ability of the system to develop [4], providing quality education.

One of the mechanisms of reforming the system of general secondary education and organizing the school network in Ukraine is the basic educational institutions - general educational institutions created for equal access of all children to quality education, rational and efficient use of resources.

We are talking about combining the efforts and resources of secondary education institutions out-of-school education institutions, children's and adolescent NGOs, etc., located in the same neighborhood, to create a single educational space, a single system of educational work, with their focus on meeting the educational needs of students.

At the same time, the search for acceptable forms of management (in particular, the use of network technology) of such educational institutions is relevant: generalization of empirical experience, development of principles of effective management, typification of various forms of such management, and conditions for its implementation.

However, the possibility of using network technology in the management of a base educational institution has not been specifically considered, which determined the choice of the research topic.



Methodology/Approach. Since there is no experience in using network technology to manage an educational institution, it is essential to identify and systematize the possibilities of using network technology in the management of a base educational institution.

Achieving this goal will help predict:

- tendencies of formation of experience of network management of the base educational institution;
- formation of theoretical generalizations regarding the network management of the base educational institution;
- contributing and limiting factors to the application of network management of the base educational institution.

In the process of scientific research, state regulations that provide for the use of network management of educational institutions are analyzed, as well as scientific achievements in philosophy, sociology, management, pedagogy on the objective necessity and possibility of application of network management of a base educational institution; the materials published on websites of base educational institutions (reports of heads of base educational institutions, regulations on the base educational institution, etc.) have been analyzed, allowing us to draw conclusions regarding the possibilities of implementation of network management of existing base educational institutions; a survey of managers of different levels was conducted in order to identify contributing and inhibiting factors in the application of network management in the activities of the base educational institution.

Findings/Results. Institutional capabilities of network interaction and network management [8] include:

– provisions of the Law of Ukraine "On Education" regarding the individual educational trajectory, individual development program, inclusive education, remote and network forms of education [1]. Such cooperation, subject to the concluded agreements and the established network management system, could facilitate their implementation.

– Act "On approval of the Regulations on the educational district." To carry out the statutory activities, BEI may, on a contractual basis, unite with other legal entities, creating educational, educational-scientific, educational-industrial, as well as other associations, each of the members of which retains the status of a legal entity [2].

The Act "On the educational district and base institution" defines the purpose, tasks, ways of fulfilling the tasks of the educational district, support institution, and its subsidiaries. The purpose of creating educational districts of base educational institutions and their subsidiaries is as follows: the creation of a single educational space and a safe educational environment; ensuring equal access of persons, including those with special educational needs, to obtaining quality education; creating conditions for persons to complete general secondary education, in particular by conducting career guidance work among students, ensuring the implementation of their individual educational trajectory, the introduction of elective courses, clubs; rational and efficient use of the resources available to the subjects of the district, their modernization.



The goal is specified in the following tasks: creating a safe educational environment, concentration and efficient use of available resources, directing the resources to meet the educational needs of students, and creating a unified system of educational work.

Among the ways to fulfill the tasks of educational districts, support educational institutions and their branches, the following way attracts special attention: creating conditions for education with the use of the latest information and communication tools and technologies [7]. The use of the latest information and communication tools and technologies creates conditions for obtaining education in remote and network forms.

In our opinion, the possibility of cooperation on a contractual basis between the base school and higher education institutions, out-of-school institutions, and public organizations, along with the use of the latest information and communication tools and technologies, allow joint use of common intellectual, informational, methodological, human and other resources.

The relatively small volume of research on network management motivated the expediency of a comprehensive understanding of the materials devoted to this problem. We have thoroughly analyzed the sources used during the scientific search and the available citations in the article (all types of publications: monographs, articles, abstracts of scientific papers, conference proceedings).

The term network is used to describe:

- decomposed system (network structure, telephone network, network schedule, network plan) [7, p.618-619.];
- multilevel marketing (network marketing) [3,10];
- Internet users associations (network communities) [5];
- associations of organizations that act in a coordinated manner on a long-term basis to achieve agreed goals (network organization) [M. Chuchkevich 106].

All networks have many characteristics in common. The main features of networks are that they are decomposed in time and space, unite a large number of consumers, and the communication among the network participants is predominantly horizontal.

In the real pedagogical practice of recent years, two main types of educational networks are actively developed and implemented: concentrated and distributed networks. The first involves the presence of a powerful resource center, where the number of incoming connections will far exceed the number of outgoing. In the second model - in the distributed network, the resource center is absent, and each participant has the opportunity to create their own trajectory of life and development [5].

Sergeeva, E. Medved, G. Grybkova give the following definitions of "network interaction." The first option presents networking as a system of horizontal and vertical connections that provide access to quality education for all categories of citizens, variability of education, the openness of educational organizations, improvement of the professional competence of teachers, and the use of modern ICT technologies [9]. The second option is to unite several secondary schools around the strongest secondary school, which has sufficient material and human resources,



which acts as a "resource center." In this case, each educational institution of this group fully provides teaching of basic general education subjects and that part of profile education (profile subjects and elective courses), which it is able to implement within its capabilities. The rest of the elective training is undertaken by the "resource center." The third option is based on the cooperation of a general education institution with higher, secondary, and primary vocational education institutions with the involvement of additional educational institutions of socio-cultural type.

The abovementioned information allowed us to consider the networking of educational organizations (institutions of higher, secondary, vocational education), cultural-educational and sports institutions as a joint activity with a common goal and objectives, and with the pooling of resources into a single mechanism to achieve them, resulting in students learning the curricula using the resources of several educational (educational, extracurricular, public) institutions.

In our opinion, the development of networking interaction is a form of comprehensive partnership. Due to network interaction, the secondary education institution becomes a part of broader educational systems and becomes an integral part of local, regional, and national spaces. The interaction within the network allows uniting all social institutions to strengthen the educational institution's capacity to create conditions for personal development.

The goal that unites institutions and organizations in networking is based on the interest of network members in using common material, human, and information resources of the network, as a result of which they to some extent minimize their own costs, meanwhile increasing the efficiency of the educational institution.

To identify opportunities for the application of network management technology, we analyzed the websites of base institutions in the Poltava region. There are 73 base institutions in the Poltava region. During the analysis of the websites, we paid attention to the coverage of the facts of interaction, partnership relations of BEI with other educational, cultural, sports institutions, etc. The statute of BEI and the report of the head of BEI on the purpose, tasks, and their implementation in the activities of BEI were analyzed.

The application of network technology of BEI management can be carried out in the presence of technical support (availability of computers, use of Internet technologies in the activities of BEI, etc.). According to the results of the analysis of the received information, 12 (%) BEI - do not have their own sites; about 2 (%) BEI information in the public domain is not found; in 15 (%) cases, information about the sites is available, but the sites were not available at the time of the analysis; 13 (%) - sites did not carry the necessary information.

Thus, in 42 (%) of the 73 BEIs, the activity of creating an educational institution's (EI's) site and filling it with relevant information, and hence the creation and use of network management technology - is still ahead. Very often, it is EIs remote from the district and regional center. Network technology, which makes it possible to provide a service to a remote end-user, could help such schools.

BEI managers are aware of the importance of technical support (availability of computers, software, use of Internet technologies in the activities of BEI), in particular in the 2019-2020 academic year (according to the reports of the heads of



BEI); thus, strengthening the material base of BEI, further computerization, the widespread introduction of computer information technologies in the educational process, and unlimited access to the Internet are necessary for teaching variable components of the working curriculum and creating favorable conditions for self-education activities of teachers.

There is an objective need to use network management technology in BEI, which has subsidiaries in their structure. There are 10 such institutions, including 3 BEI with 1 subsidiary; 3 BEI - 2 subsidiaries; 2 BEI - 3 subsidiaries; 1 RAM - 4 subsidiaries; 1 BEI - 5 subsidiaries.

The BEI has accumulated experience in using network control elements that deserve to be generalized. Analysis of the existing experience of BEI in the Poltava region shows that opportunities for networking and network management of shared resources are present in the following experiences:

- cooperation with other educational institutions, art schools, preschool, and out-of-school education institutions (Houses of Children and Youth Creativity), higher education institutions;
- in the experience of operation of subsidiaries of cultural, artistic, and sports institutions for students of one BEI;
- in the experience of joint career guidance work;
- in the standard of publicly active school "Partnership." Among the partners are parents, local authorities, sponsors, private entrepreneurs, private agricultural enterprises.

BEI is the largest and most powerful unifying center in a particular area. This state of affairs and close cooperation can be the basis for considering the capabilities of all actors to strengthen the educational capabilities of BEI and create network management.

We conducted a survey "Evaluation of the effectiveness of network interaction of educational institutions." The survey participants were asked 10 questions.

In particular, when asked about the content of networking, the majority (95%) said that the teacher organizes networking with one or more students and considers the interaction of students with each other. This indicates that the respondents meant pedagogical interaction, which is based on the joint activities of learners and adults, and there is a direct or indirect influence of the subjects of this process on each other during the exchange of information, taking into account the personal characteristics of interacting subjects. Network interaction can be considered as a variant of pedagogical interaction. Preserving the essence and basic parameters of pedagogical interaction, it extends to the subjects of interaction (network subjects): teachers, students, and educational organizations during the exchange of educational resources.

Analyzing the answer to the question: "What tools can be used to organize networking," we obtained the following results: most managers note that the organization of networking is provided through the school website, Skype, as well as e-mail and electronic diary of educational institutions. Since the main tasks of the district, support institution, and its branches are the concentration and effective use of available resources, their focus on meeting the educational needs of students (pupils), and creating a unified system of educational work, the answers mean the use of



remote access to these resources through the Internet.

It should be noted that many leaders understand the forms of learning in the network interaction of educational organizations: distance learning, extracurricular activities, project implementation (project activities), round tables, fairs, etc. Based on the answers of educational organizations, it should be concluded that educational organizations demonstrate knowledge of various organizational forms of pedagogical interaction, but the answer to this questionnaire provided information on the network form of educational programs, including compliance with the requirements for "... creation of a single educational space", "rational and efficient use of available resources of the subjects of the educational district, their modernization." According to this, networking is a joint activity of educational institutions aimed at improving the quality of educational activities and consists of the exchange of experience, joint development, and use of innovative methodological and human resources. Based on the results, we can conclude that most schools consider networking with other educational organizations, including preschools, sports centers, as well as with cultural and artistic institutions and more.

There were other answers of the heads of educational organizations; for example, network interaction should be established with the enterprises of the city, libraries, with higher education institutions, research institutes, departments of education, centers of vocational guidance work, etc. This shows once again that many leaders confuse the concepts of "networking" and "cooperation" of educational organizations, and some do not understand what networking is.

Leaders who use networking with other educational organizations note a positive networking experience that has allowed them to use the resources of other organizations in the school's educational process, but most educational organizations respond that they do not have networking experience. Almost 90% of respondents do not have a network interaction program. There is no schedule of joint educational activities within the network. Usually, the network interaction agreement is replaced by a cooperation agreement. These results indicate insufficient legal support, which regulates the network interaction of educational organizations.

Answering questions about the difficulties seen by managers and teachers in the organization of network interaction - first of all, there is a lack of legal framework, difficulties in finding partners ready for network interaction, as well as shortcomings in understanding the nature of forms of network interaction. The following aspects can also be highlighted: school principals note that not all partners are ready for networking; this form cannot be provided in a remote area in the absence of high-speed Internet; insufficient material and technical base and thematic filtering limit the possibilities of using network interaction; there is no mutual understanding of the importance of network interaction, etc.

However, all school principals have a clear understanding of the areas in which it is important to develop networking - this is the development of the material and technical base of educational organizations; methodological support; advanced training of specialized education staff, and within the framework of network partnership, quality assurance of education, organization of extracurricular activities.

To identify the resource shortage in educational organizations, school principals



were asked the following question: "What operating systems are lacking for your EI to improve the quality of education?" The following result was obtained: human resources are lacking (heavy workload on teachers, no young people, aging staff, lack of computer science teachers; lack of suitably qualified management in network technology, and subject teachers).

According to the principals, the schools also lack material and technical resources, namely: there is no equipment for specialized educational environments (offices, laboratories, kits for robotics; outdated equipment, etc.). Heads of educational organizations note the imperfection of information resources, the need for financial resources for networking. Organizational and managerial constraints are not mentioned, which, in our opinion, indicates a lack of experience in sharing the resources of organizations within a network.

It should be noted that not all educational organizations are ready to participate in networking. The answer to this question indicates that educational institutions, having experience in various corporate, regional networks, and information environments, are not yet actively willing to choose networking as the most suitable way to communicate with all participants in the educational process, positioning innovative educational programs in the educational space of the Poltava region.

This may be due to shortcomings or risks in the use of mechanisms for organizing horizontal interaction between educational institutions to distribute functionality and resources; features of dissemination of experience of networked communities of educational orientation, which communicate with educational goals and have stable social roles, as well as adhere to certain norms of behavior in cyberspace. In network interaction, the norms of activity are not set from above but are naturally developed within the network of educational institutions, based on the realities of the activities of each member of the network.

Conclusion/Implications/Recommendations. Thus, the following contradictions were revealed: on the one hand, most leaders of educational organizations do not understand the meaning of "network interaction" and confuse it with the concept of "cooperation," and as a result, leaders do not exchange resources and do not know the necessary conditions for effective network interaction; on the other hand, almost 95% of school leaders understand that networking helps to improve the quality of educational activities of its participants. However, there are leaders who do not see the need for networking, and some even believe that networking does not improve the quality of educational activities.

The use of networking is associated with certain challenges and additional management measures, in particular: rapid response to changes and difficulties arising in the educational process, namely: for example, students' struggles in solving mathematical problems can be solved through networking (e.g., involving primary school teachers from other educational organizations in which students do not have difficulties, as well as responding quickly to the problem, solving it "just in time" and "at the lowest cost"), which in turn necessitates staffing issues.

Achieving a better result in general by coordinating the actions of all interconnected participants in the network processes (using the material, human, and information resources) of several educational organizations, as well as quickly



regulating the conditions that positively affect the activities (conducting monitoring studies of learning outcomes of students not only by teachers but also by the heads of educational organizations, which must exercise constant ongoing monitoring of student performance and make effective management decisions) will enable organizing a systematic approach to achieving goals aimed at improving the quality of education in educational institutions.

Network management will make it possible to focus on attracting such potential that effectively achieves goals quickly, shows selectivity, the desire to reduce costs or time to move resources (human, material, information) in terms of the ability to solve certain tasks.

References

1. Act "On approval of the Regulations on the educational district", 777, Cabinet of Ministers of Ukraine (2010). Retrieved from: <http://zakon2.rada.gov.ua/laws/show/777-2010-%D0%BF>
2. Act "On Education", 2145-XII, Law of Ukraine (1992). Retrieved from: <http://zakon2.rada.gov.ua/laws/show/2145-12>
3. Amrita Club. (n.d.). Network marketing. Retrieved April 15, 2021, from https://amrita.club/blog/merezhevij_marketing/2009-01-01-217
4. Chuchkevich, M.M. (1999). Fundamentals of managing network organizations. Moscow: Institute of Sociology RAS.
5. Davydova, N.N. (2009). Network Interaction Organization of Innovative-and Active Educational Establishments. Bulletin of the South Ural State Humanitarian Pedagogical University, (12), 13-26. Retrieved from <https://cyberleninka.ru/article/n/organizatsiya-setevogo-vzaimodeystviya-innovatsionno-aktivnyh-obrazovatelnyh-uchrezhdeniy>
6. Fraltsova, T.A. (1999). Organizational and pedagogical conditions for the formation of a regional educational district. Abstract for the degree of candidate of pedagogical sciences. Kemerovo State University in Kemerovo, Russia.
7. Pastovenskyi, O. (2012). Network model of general secondary education management. Ridna Shkola, (6), 13–18.
8. Sas, N. (2018). Fundamentals of innovative management of educational institutions: a textbook. Lap LAMBERT Academic Publishing.
9. Serheeva V.P., Medved E.Y., & Hrybkova H.Y. (2016). Networking in education as a function of improving the quality of training of students. Modern high technologies, (7-1), 195-199.
10. Zaiachkovska, H.A. (2016). Synopsis of lectures on the subject "Network Marketing" (students in the training program 6.030507 "Marketing"). Ternopil: TNEU.

***Анотація.** Автор обґрунтовує можливість застосування мережевої технології управління закладом освіти. Мережева взаємодія розглядається автором як форма організації партнерства спільна діяльність із загальною метою та цілями з об'єднанням ресурсів для їх досягнення в єдиний механізм, в результаті чого здобувачі освіти засвоюють навчальні програми з використанням ресурсів кількох освітньо-виховних (навчальних, позанавчальних, громадських) закладів. Оскільки досвід застосування мережевої технології*



управління закладом освіти відсутній, автором здійснено виявлення та систематизація таких можливостей в управлінні опорним закладом освіти. Досягнення мети дослідження здійснено на основі виявлення тенденцій формування: теоретичних узагальнень стосовно мережевого управління; досвіду мережевого управління; сприяючих і обмежуючих факторів застосування мережевого управління опорним закладом освіти.

Ефективне застосування і розвиток виявлених можливостей дозволять прискорити виконання інституційних положень стосовно індивідуальної освітньої траєкторії, індивідуальної програми розвитку, інклюзивного навчання, дистанційної та мережевої форм здобуття освіти; створення безпечного освітнього середовища, концентрація та ефективне використання наявних ресурсів, їх спрямування на задоволення освітніх потреб здобувачів освіти, створення єдиної системи виховної роботи.

Аналіз сайтів опорних закладів освіти Полтавської області України виявив, що можливості для мережевої взаємодії та мережевого управління спільними ресурсами є у досвіді: співпраці з іншими закладами освіти, художніми школами, закладами дошкільної та позашкільної освіти (будинками дитячої та юнацької творчості), закладами вищої освіти; у досвіді діяльності філій культурно-мистецьких, спортивних закладів для учнів одного ОЗО; в досвіді спільної профорієнтаційної роботи. Серед партнерів називають : батьків, органи місцевої влади, спонсорів, приватних підприємців, приватні сільськогосподарські підприємства.

Key words: заклад освіти, мережева технологія управління, можливості (інституційні, теоретичні, досвід)

Статья отправлена: 15.11.2021 г.

© Сас Н.М..