Networked Learning in a Pandemic: New Horizons for Use

I. A. Nagaeva[1][a], E. A Frolova[2][b] and A. G. Erohin[2][c]
[1]*Natural Sciences Chair, Moscow International University, Moscow, Russia*
[2]*Department of Business Informatics, Moscow Technical University of Communication and Informatics, Moscow, Russia*

Keywords: Online Learning, Heutagogy, Connectivism, Peer To Peer Learning, Paragogy, Rhizomatic Learning, Virtual Learning Space.

Abstract: The peculiarities of training at the present time are: the possibility of accumulating and systematizing initial information, as well as the possibility of organizing and participating in large-scale discussions. Networked learning is a relatively new paradigm of educational activity based on the idea of mass cooperation, the ideology of open educational resources, in combination with a networked organization of interaction between participants. In the context of the coronavirus pandemic, we can observe an increased interest in networked learning technology. The article examines the formation and development of learning through network technologies, provides various points of view on modern paradigms of education, assesses the effectiveness of using such technologies in a pandemic.

1 INTRODUCTION

For quite a long period of time, we can observe in the modern educational process such trends as the development of innovative technologies, the introduction of the educational model of Life-Long Learning. Their implementation is directly related to the development of information and communication technologies, the increased volume of educational and scientific content, and the active interaction of users in the network. The coronavirus pandemic was the impetus for intensifying these trends. The coronavirus literally turned everything and everyone upside down, making its own adjustments in many directions.

Changes and innovations in education have resulted in the emergence of new learning theories. Such theories include autogy (the science of self-education), connectivism (the science of modeling behavioral phenomena by the processes of becoming in networks of interconnected simple elements), peer-to-peer models, paragogy, rhizomatic learning model, network learning. The latest model has acquired particular relevance, such processes have acquired during the COVID-19 pandemic, when the transition to distance learning has become almost inevitable.

It should be noted that within the framework of the national project in the field of education, changes were also assumed earlier, discussions of the remote learning system were held. But discussing is one thing, and it is another thing to suddenly switch to distance learning for everyone.

For almost a year now, distance and digital have been mastered everywhere. Each university chooses technologies and formats that are suitable for it. The main task is to keep the content as much as possible so as not to worsen the quality of education.

In this article, the authors attempted to analyze the existing experience of using networked educational technologies in a pandemic. The research is based, in particular, on the personal experience of authors – teachers of various disciplines at the Moscow Technical University of Communications and Informatics and the Moscow International University.

[a] https://orcid.org/0000-0002-5890-2622
[b] https://orcid.org/0000-0002-7668-0335
[c] https://orcid.org/0000-0002-7688-5453

Nagaeva, I., Frolova, E. and Erohin, A.
Networked Learning in a Pandemic: New Horizons for Use.
DOI: 10.5220/0011112700003439
In *Proceedings of the 2nd International Scientific and Practical Conference "COVID-19: Implementation of the Sustainable Development Goals" (RTCOV 2021)*, pages 184-188
ISBN: 978-989-758-617-0

2 RESEARCH METODOLOGY

The provisions of connectivism are based on the theory of networks, complex and self-organizing systems. Siemens (2012, 2006) proposes to consider learning as a process in an uncertain, constantly changing and dynamically developing environment. The learning process is built from related information source nodes (organizations, websites, libraries, databases, people or any other source of information). Learning networks can be both internal structures (creating a model of understanding in our minds) and external (connecting external knowledge to gain experience).

Downes (2010) describes the theory as follows: learning is to include yourself in the network. Students advance in their education by interacting with practitioners, starting by copying models. This process of copying activities is supported by reflection and corrected by other members of the community.

The network is based on the community, resources are of secondary importance. Only personal knowledge constitutes a network that supports the development of the community, which in turn supports the development of the network and, through its development, the training of other participants. Within the network, concepts differ: data (raw information), information (intelligently processed data), knowledge (information used), meaning (awareness of information). Learning is presented as a process of transforming knowledge into meaning and action through interaction with other people, with a teacher. In the process of transformation, the nodes of the network are reorganized and form connections - a training shell.

The practical implementation of the connectivism ideas is the introduction of network learning technology, which is based on the idea of mass cooperation, the ideology of open educational resources, in combination with the network organization of the interaction of participants. Networked learning is based on the ideas of “horizontal” learning activities and peer learning (i.e. peer-to-peer learning and learning) as opposed to traditional pedagogy and andragogy.

Analysis of domestic and foreign sources written by Corneli & Danoff, C. J. (2011)., Smith, B. L. & MacGregor (1992), Patarakin (2006), Polyakova (2008) shows that the concept of the “equal to equal” model is considered a promising direction in higher professional education. In network learning, this model is implemented through information and communication technologies: students interact in the learning community mode, making an equal contribution to solving common problems. In this case, we are talking about "controlled" communication with the aim of mastering educational programs. The peer-to-peer model can be implemented here in training formats that require active interaction of its participants. Participants of the educational process, mediated by information and communication technologies, carry out joint design and creation of a common educational space, develop the necessary educational content.

3 RESEARCH RESULTS

Networked learning implements two approaches to learning: individual and personal.

Individual training is a model of the organization of the educational process, in which the teacher interacts with only one student, taking into account his personal characteristics, creating psychological and pedagogical conditions for his development. This model implies the presence of a mentor or leader who builds a learning trajectory for the student (listener, learner). Individual training implies the presence of a mentor or leader who builds a learning trajectory for the student (listener, learner). Because not everyone has critical thinking and is able to filter out the amount of information that is on the Internet. The advantage of this training is that it allows you to adapt the content, methods and pace of the student's learning activity to his characteristics. The trainee has the ability to control the expenditure of his forces, to work at the optimal time for himself, which allows him to achieve high results of his training.

Personal learning is the attitude of the student to his education, i.e. awareness of the need to learn a particular subject, to obtain preferred information for oneself. The advantages of this training:

- self-management of one's own learning;
- independent setting of educational goals;
- the student works at his own pace;
- drawing up a personal training plan (learn only what you do not know);
- individual communication with the teacher;
- the possibility of training in one group with trainees of different levels of training during the period of studying a certain topic;
- constant checking of the acquired knowledge.

Currently, personal learning is implemented by PLE (Personal Learning Environment), which refers to the tools, communities, services and a set of resources on which individual educational platforms

are based, intended for use by learners. A typical PLE is educational blogs (eg Twitter), YouTube and similar sites, RSS feeds. Thus, PLE is an environment in which the opportunity for self-management of one's own learning and self-setting of educational goals is provided, as well as a special approach to learning is implemented.

Austrian philosopher Ivan Illich (2006) proposed to embody the ideal educational system in the form of a "learning web", which provides everyone with access to the available resources at any time and regardless of their age, supports the efforts of everyone who wants to share their knowledge and skills in finding those who wants to learn from them and, finally, provides everyone with the opportunity to publish and present the results of their learning for public discussion. French teacher Célestin Freinet (1990) proposed the idea of expanding the interaction of students, based on the following principles of organizing the educational process:

- no training, there is problem solving, analysis, expertise;
- there are no study assignments, there are constantly asked questions;
- no ratings, but personal proposals differ;
- there are no mistakes - there are misunderstandings;
- there are no curricula, there is individual and group planning;
- there is no teacher, but there is a teacher for organizing a common cause;
- the teacher does not educate, but solves common problems;
- there is no class, there is a community;
- the community is governed by the norms of the community adopted by the students themselves.

The embodiment of Freinet 's idea was the creation of a school correspondent network, where students from different schools corresponded with each other, correspondent schools exchanged educational and social information. The experiment was viewed as an image of the context of "live communication". Peer education is reflected in the theory of horizontal learning, paragogy (or peer learning and learning theory). The principles of paragogy are adapted principles of andragogy by Knowles (1970), developed in the context of “horizontal” learning”.

4 DISCUSSION

Thus, the analysis of foreign sources (Benkler, (2005), Verhagen, (2006), Siemens (2012, 2006)) allows us to formulate the following principles of paragogy related to learning with the use of distance learning technologies.

- Collective context in motion: identifying ways of supplementing and changing content by learners. Search for contextual features of the learning environment that affect the possibility of self-education. The development of the learner is determined in relation to the context of the activities of other participants in the environment.
- Meta-learning as a source of knowledge: using information to predict academic performance and achievement.
- All are equal, but all are different: the learning experience includes the reflection of opposing points of view. Optimal integration into study groups with a teacher recommended by the course administration.
- Learning activity is distributed and non-linear: defining one's own learning path in the learning environment.
- Implementation of motivation and transition to the next goal: measuring the contribution to joint activities.

The practical application of paragogy is reflected in the context of P2P University (P2PU), which implements such a form of distance learning as P2P learning (peer-to-peer, horizontal model of mutual learning). P2PU is a fundamental open education project that organizes the learning process outside the walls of traditional institutions and gives students the opportunity to assess their achievements.

The project is based on the use of open educational resources. A kind of network community has been created from open groups for the study of small courses at the university level. Before the start of classes, a preliminary training plan is drawn up. Working in a group, participants jointly search for, study educational resources, conduct discussions and complete assignments on the declared topics of the course. To assess the results of the participants' activities, an expert is invited who proposes the final tasks and evaluates their implementation. No formal documentation system has yet been developed for successfully completing courses, but online and licensed expert assessments are proof of competence in this area.

P2P course programs are designed to help non-professionals create Internet projects, develop their own content. In P2PU courses, mutual learning takes place through learning problems that the learners solve for themselves and help others solve. For example, as a result of the implementation of the Mozilla Drumbeat project, a beta version of the Drumbeat site appears, which will host a database of logos and their components, as well as a special training course that allows novice web designers to

create their own graphics without violating the copyrights of other designers.

There are three types of courses in P2PU: the course itself, the study group and the challenge. The test course involves the creation of an independent project. As a result of the discussion of educational tasks common to all participants and the exchange of results, a joint product is developed. The innovative educational technologies discussed above are preferably used in individual learning. For the implementation of personal training, such a new direction as rhizomatic training, more precisely, a view of educational activity, is suitable. The cognitive trajectory is a growing branch that has no beginning, center, end. From the student's point of view study only what is interesting or important for him at a given time. The main points were formulated by the Canadian researcher Dave Cormier (2019).

1. The best training is the training that prepares us for uncertainty.

2. The community itself can be a learning content when there are no other options.

3. Rhizome is a model for learning how to deal with uncertainty.

4. Rhizomatic education is designed to study complex subject areas.

5. It is necessary to make students responsible for their own learning activities (as well as the learning activities of others).

From our point of view, the rhizomatic model is applicable only at the junction of areas of knowledge, where not the result of educational activity is assessed, but the independent efforts of students in obtaining additional information from related disciplines using information and communication technologies.

Nowadays, new concepts have emerged in networked learning, namely, "smart room" and "mobile campus". So, for example, a mobile campus is understood as a technological platform, i.e. a set of tools, network services and pedagogical technologies within the framework of mobile learning, which allows the combination of non-formal and social types (channels) of educational activities with formal training in the framework of a traditional educational institution (Travkin, 2013). One of the types of training sessions for students studying with the use of distance learning technologies is a webinar. A webinar is an on-line lesson conducted by a teacher based on active teaching methods. It is aimed at mastering and consolidating the educational material by students, mastering the methods of collective work and exchange of experience, developing the skills and abilities of educational and professional activities, as well as adjusting the process of independent cognitive activity (Nagaeva, 2016).

In comparison with traditional practical classes and seminars, the feature of the webinar is its content and methodological richness, the specificity and practical nature of the training questions being worked out. They provide for the formation of students' professional interest, the active participation of each student in the discussion of educational material and the implementation of certain actions (activities). The main task of the teacher in this case is the performance of an organizational function associated mainly with the direction and adjustment of the general course of the lesson.

As a rule, the webinar is organized after students independently study the academic discipline, its section, topic, or a set of topics.

To implement the paradigm of network learning, appropriate hardware and software are required. In connection with the spread of the pandemic, an incentive was given for the development and improvement of software products that implement network learning technologies. Modern technical and software tools and a high level of proficiency in them have made it possible to level the complexity of the transition to distance learning for teachers and students. Both of them very quickly adapted and were able to work productively through online platforms.

Our universities are actively developing cooperation with 1C. One of the productive solutions from the 1C company for creating a management system for e-learning and blended learning is 1C: E-learning, with the help of which it becomes possible to conduct e-learning and testing in a local network and via the Internet / Intranet, including from smartphones and tablets when using the software product "1C: E-learning. Teacher and student web office ". It is also necessary to mention the product “1C: E-learning. Corporate University ".

5 CONCLUSIONS

Learning using distance educational technologies takes place in an open communicative space through interactive classes, which creates additional opportunities for analyzing the results of educational activities. The created friendly environment promotes free communication between all participants in the educational process to carry out joint actions to achieve the learning goals. At the same time, the teacher helps the development of communication and creative abilities, controls the educational activities of the students. As our research has shown, the most

appropriate term for defining a student's personal space in the learning system with the use of distance learning technologies is the term “virtual learning space” as a system, the structural elements of which are as follows:

- participants in the educational process;
- information educational resources available, as well as created by participants in the learning process;
- interaction of participants through a network service.

If we analyze the above terms PLE (Personal Learning Environment) and LMS (Learning Management Systems), then the former concentrate on the learners, and the latter on the training courses. Consequently, when the personal learning environment intersects with learning management systems, a virtual learning space is constructed in which learners can use certain LMS components. The rationale for the need to use a virtual learning space is a real two-way educational process, the effective use of electronic resources, and on this basis - the intensification of learning, the organization of personality-oriented learning, accustoming to independent cognitive activity of the student.

The virtual learning space, through which the interaction of participants in the educational process is carried out, is multifunctional. The deeper the students immerse themselves in this space, the more fully the possibilities and its functions as a space of communication, learning, self-education, information are revealed. Learning in a virtual learning space is the interaction of participants in the educational process, which reflects all its characteristic components (goals, content, methods, organizational forms, learning tools) by information and communication means.

The effectiveness of the "virtual learning space" model is achieved due to a set of conditions:

- learning in a learning environment;
- training depending on work experience;
- in groups of different subjects.

An example is open online courses in related disciplines in the form of videoconferences, where social ties between participants are strengthened (forums, blogs, chats, tweets), leaders are nominated for the development of any projects, and external interdisciplinary ties are established. The result of active interaction in the "virtual learning space" will be the creation of a new collective information resource.

Thus, the created virtual learning space is located in the space of multilevel educational programs, which makes it possible for lifelong education, for the formation of prospects for one's own education, etc. and is aimed at developing professional competence. Each student, as a result of cooperation, creates his own learning space that meets his personal needs, the learning strategy chosen by him. In the context of the coronavirus pandemic, this seems to be especially relevant. As you know, 2021 has been declared the year of science and technology in Russia. This will undoubtedly bring with it the opportunity to implement a large number of large-scale, interesting projects in the field of science and education, including network learning.

REFERENCES

Benkler, Y., 2005. *Common Wisdom: Peer Production of Educational Materials*, Center for Open and Sustainable Learning.

Corneli, J., Danoff, C. J., 2011. Paragogy: Synergizing individual and organizational learning. In *the 1st International Conference on Learning Analytics and Knowledge*.

Cormier, D., 2019. Rhizomatic Education. *EdTech in the Wild*.

Downes, S., 2010. The Knowledge Hunters by Stephen Downes.

Freinet, C., 1990. *Selected Pedagogical Works: translated from French*. Progress.

Illich, I., 1971. *Deschooling society*.

Knowles, M.S., 1970. *The Modern Practice of Adult Education*. Andragogy versus Pedagogy.

Nagaeva, I.A., 2016. Blended learning as a necessary modern educational process. *Domestic and foreign pedagogy,* 6 (33): 56-67.

Patarakin, E., Burov, V., Yarmakhov, B., 2019. Computational Pedagogy: Thinking, Participation, Reflection. In *Digital Turn in Schools—Research, Policy, Practice*, pp. 123-137. Springer, Singapore.

Polyakova, V.A., 2008. Forming Teachers Readiness to Interact in Online Educational Communities. *Modern Problems of Science and Education*, 6: 100– 106.

Siemens, G., 2012. Learning analytics: envisioning a research discipline and a domain of practice. In *Proceedings of the 2nd International Conference on learning analytics and knowledge*, pp. 4-8.

Siemens, G., 2006. *Knowing knowledge*. Lulu. com.

Smith, B.L., MacGregor, J.T., 1992. What is collaborative learning. *Towards the Virtual University: International Online Learning Perspectives*, pages 217-232.

Travkin, I. Y., 2013. Mobile campus: a reflective and collective dimension of educational activities mediated by mobile technology. *Economics, Statistics, Computer Science*, 1: 15-20.

Verhagen, P., 2006. *Connectivism: A new learning theory*.