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DEVELOPMENT OF SOCIAL NETWORKS AND SERVICES IN TEACHING STUDENTS: EXPERIENCE OF DISTANCE LEARNING IN THE CONTEXT OF THE COVID-19 PANDEMIC

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Abstract

The pandemic caused by the acute respiratory disease COVID-19 has forced the education system to switch to distance learning, either partially or completely. The use of social networks can bring greater interactivity into the educational process under these conditions, have a positive effect on the results of students' cognitive activity, and become an efficient means of increasing the motivation and quality of learning, organizing the collective work of students, performing joint project activities, and individualizing the student's virtual learning space. Social networks can also be used as a means of distributing educational material. The specifics of the applications and the capabilities of social networks and services in distance learning have been described in the article; a theoretical analysis of the basic concepts of the articulated topic of the article has been carried out. Learning tasks have been identified on the basis of an expert survey, which can be solved through social networks; the applications of social networks VKontakte and Facebook for organizing distance educational process have been described; and methods of combining social networks and an information and organizational distance learning environment have been presented.

Keywords

Social network – Application – Distance learning – COVID-19 pandemic

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Introduction

The Internet services, called social services and developed by large IT corporations, occupy a special place in the development of information and communication technologies at the present stage. The existing social services can be grouped according to some common criteria: photo and video storage (Flikr, Flamber, FilkLab), services for shared work with documents (GoogleDocs, Dropbox, OneDrive), services for shared editing and changing semantic content (Blogger, Wiki), geoservices (GoogleMaps, GoogleEarth, Wikimapia), and services for communication and entertainment – social networks (Facebook, Twitter, VKontakte, Odnoklassniki)¹.

The popularity of social services is growing, including among young people who are recipients of educational services provided by educational institutions. As such, the functional integration of new social Internet services with the university learning environment can lead to the fact that the participants of the educational process will be able to operate the distance educational content as quickly and conveniently as possible and spend the least effort and time on it². The researchers³ usually refer to social network as a virtual platform, Internet website, web service, or portal on the Internet, their purpose being to unite as many people as possible, providing them with the maximum communication opportunities. H. Kennedy⁴ defines social networks as a tool for spreading knowledge and establishing connections with people of similar interests. According to R. Mason and F. Rennie⁵, a social network is an online space that can be largely customized by its users, providing an environment for personal profiles that users create in order to connect with others.

The world's largest social network Facebook currently accounts for more than one billion active users (visiting it at least once a month). Ninety-six percent of the young people born at the end of the 20th century are registered in at least one social network⁶.

¹ T. O'Reilly, "What is Web 2.0: Design patterns and business models for the next generation of software", Communications & Strategies Vol: 65 num 1 (2007): 17 - 37 y N. B. Ellison, "Social network sites: Definition, history, and scholarship", Journal of Computer-Mediated Communication Vol: 13 num 1 (2007): 210 - 230.

² V. D. Sekerin; M. N. Dudin; A. E. Gorokhova; T. P. Danko y N. I. Nikolaykin, "Applying Interactive Marketing Methods to Improve the Quality of University Educational Services", Quality – Access to Success Vol: 19 num 163 (2018): 37 – 42; V. D. Sekerin; M. N. Dudin; A. E. Gorokhova; V. I. Gayduk y V. I. Volkov, "Creation of a Virtual Image: Digital Technology of the 21st Century", Amazonia Investiga Vol: 8 num 20 (2019): 340- 348 y M. N. Dudin; J. S. Shishalova; E. A. Pogrebinskaya; V. N. Sidorenko; E. I. Sukhova y N. Y. Zubenko, "Cross-cultural management in the system of harmonization of interests in the multi-confessional educational environment", European Journal of Science and Theology Vol: 15 num 3 (2019): 191 – 199.

³ G. Merchant, "Unravelling the social network: theory and research", Learning, Media and Technology Vol: 37 num 1 (2012): 4 - 19; B. Howard, "Analyzing online social networks", Communications of the ACM Vol: 51 num 11 (2008): 14 - 16 y M. Castells, Virtual Communities or Network Society? The Internet galaxy: reflections on the Internet, business, and society (Oxford: Oxford University Press, 2001).

⁴ H. Kennedy, "Beyond anonymity, or future directions for internet identity research", New Media & Society Vol: 8 num 6 (2006): 859 – 876.

⁵ R. Mason y F. Rennie, "Using Web 2.0 for learning in the community", The Internet and Higher Education Vol: 10 (2007): 196 – 203.

⁶ C. M. Cheung; P.-Y. Chiu y M. K. Lee, "Online social networks: Why do students use Facebook?", Computers in Human Behavior Vol: 27 num 4 (2011): 1337 – 1343 y D. Fodeman y M. Monroe, "The impact of Facebook on our students", Teacher Librarian Vol: 36 num 5 (2009): 36 – 40.

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The scientists consider the formation of communities of practice as the main thing in the learning process in social network environments, their structural elements being described in⁷, namely: the domain, the community, and practice. The domain represents a point of contact where members share their ideas, knowledge, and stories, creating personal meaning and strategic value. The community is a group of people who learn and interact with each other, build relationships that form feelings of belonging to the group and mutual commitment. According to the theory of social constructivism, the understanding of the world arises from the person's own partial understanding of it. People who are interested in the lives of their peers regularly use MySpace and Facebook to create their general outlook. At the same time, the domain outlines the topic of the community, focusing on the practice of specialized knowledge; the community is developed and supported. The network participants change their way of thinking while working on a task (and the nature of the task itself), and can also experience incredibly widespread social changes. Social technologies offer opportunities for engaging in interactive dialogue and learning tools⁸.

According to Y. Beldarrain⁹, the advantages of social networks for their use in working with young people are that they are familiar technologies for most students, i.e., teachers do not need to teach them how to work (as in the case of distance learning systems). The popularity of the service implies interest in its use, which can be used for educational purposes. In addition, students can popularize their educational or scientific activities carried out through a social network. In general, working in a familiar environment, which is most often used for entertainment and communication with friends, will be psychologically comfortable for distance learning purposes as well. In addition, the students remain at home in the familiar environment¹⁰.

N. McCarroll and K. Curran¹¹ note that when communicating with a teacher through social networks, students can ask any questions without experiencing peer pressure and

⁷ G. Olson; G. Mark; E. Churchill y D. Rotman, "New missions for sociotechnical infrastructure", Computer Vol: 43 num 11 (2010): 37 – 43; M. Burke; C. Marlow y T. Lento, Feed me: Motivating newcomer contribution in social network sites. ACM CHI 2009: Conference on Human Factors in Computing Systems. 2009 y S. D. Ryan; M. J. Magro y J. H. Sharp, "Exploring educational and cultural adaptation through social networking sites", Journal of Information Technology Education Vol: 10 (2011): 1 – 16.

⁸ M. N. Dudin; V. V. Bezbakh; E. E. Frolova y M. V. Galkina, "Models of the higher education in Russia and the countries of Europe at the beginning of the 21st century: main directions of development", European Journal of Contemporary Education Vol: 7 num 4 (2018): 653 – 667 y I. A. Skripak; S. N. Aynazarova; E. V. Ukhanova; A. E. Tkachenko y L. S. Erina, "Digital Virtualization Technologies in Distance Learning", International Journal of Advanced Trends in Computer Science and Engineering Vol: 9 num 2 (2020): 1808-1813.

⁹ Y. Beldarrain, "Distance education trends: Integrating new technologies to foster student interaction and collaboration", Distance Education Vol: 27 num 2 (2006): 139 – 153.

¹⁰ A. I. Nikiforov; A. M. Avdonina; T. V. Dikova; A. S. Bagdasarian y I. Y. Ilina, "Formation of a Continuing Education System in Modern Conditions", Universal Journal of Educational Research Vol: 8 num 5 (2020): 1772 – 1777; V. A. Slepov; T. N. Rodenkova; M. E. Kosov y A. I. Grishin, "Human Capital Development as an Element of Financial Management in National Education Systems", Journal of Advanced Research in Law and Economics Vol: 10 num 4 (2019): 1303-1308 y V. A. Slepov; T. N. Rodenkova; M. E. Kosov y A. I. Grishin, "Human Capital Development as an Element of Financial Management in National Education Systems", Journal of Advanced Research in Law and Economics Vol: 10 num 4 (2019): 1303-1308 in Law and Economics Vol: 10 num 4 (2019): 1303-1308.

¹¹ N. McCarroll, K. Curran, "Social Networking in Education", International Journal of Innovation in the Digital Economy Vol: 4 num 1 (2013): 1 – 15.

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fear of being ridiculed; they can work directly on specific incomprehensible issues of the training course. Both the teacher and the student can create their own educational content, transform it, rethink, and discuss.

According to N. Arnold and T. Paulus¹², social networks are also attractive because they can be accessed from any device. They have a simple user interface that young people are used to and integrate many additional services that can be used to create the independent learning content.

Despite a number of advantages associated with the use of social networks in the educational process, the researchers¹³ note some problems that accompany their use — in particular, the observance of communication etiquette among the participants, the inability to constantly monitor the use of social networks specifically for educational purposes, etc. In addition, the teacher will not always be able to keep track of the correctness of educational materials uploaded by students¹⁴.

M. Blankenship¹⁵ emphasizes the importance of the students' reaction to the content functional components of the learning environment and the information resources they are granted access to. Working with certain information resources can force students to react to their rejection or blocking and can lead to an overestimation of the students' established values. Some of them can cause uplift, while others can lead to a complete loss of interest in learning.

The goal of the article is to analyze the capabilities of social networks and services in the distance learning of students in the context of the COVID-19 pandemic.

The hypothesis of the research is that the use of social networks in teaching students in the context of the COVID-19 pandemic is possible through the integration of social networking services and an information and organizational distance learning environment.

According to the results of the study, it can be concluded that the goal set in the study has been achieved.

¹² N. Arnold y T. Paulus, "Using a social networking site for experiential learning: Appropriating, lurking, modeling and community building", The Internet and Higher Education Vol: 13 (2010): 188 – 196.

¹³ E. Nini, Private open source social networking media for education, Proceedings of the Fifth International Conference on e-Learning, 2015; G. Conole y J. Culver, "The design of Cloudworks: Applying social networking practice to foster the exchange of learning and teaching ideas and designs", Computers & Education Vol: 54 (2010): 679 – 692 y I. Liccardi; A. Ounnas; R. Pau; E. Massey; P. Kinnunen; S. Lewthwaite; M.-A. Midy y C. Sarkar, "The role of social networks in students' learning experiences", Proceeding of ACM SIGCSE Bulletin Vol: 39 (2007): 224 – 237.

¹⁴ V. V. Ryabov; V. V. Kirillov; R. G. Rezakov y N. I. Muzafarova, "International practice of professional integration of People with Disabilities: Educational Programs", Revista Inclusiones Vol: 7 num Especial Enero-Marzo (2020): 42-53 y E. M. Akishina, "The axiological potential of Mastering the Art of the late 20TH and early 21ST Century in contemporary educational institutions", Revista Inclusiones Vol: 7 num 1 (2020): 95-111.

¹⁵ M. Blankenship, "How social media can and should impact higher education", Education Digest Vol: 76 num 7 (2011): 39 – 42.

Methods

An indicative set of theoretical and empirical research methods was defined to achieve the goal set in the study:

- theoretical methods (analysis, synthesis, comparison, and generalization) were used for the study of scientific literature on the state of the research problem, and

- empirical methods (expert survey).

The main research method was an expert survey in this field of research. The experts were asked to fill out a semiformalized questionnaire on a voluntary basis.

The survey involved experts (40 people), who were employees of Russian higher educational institutions, their professional activities being related to the implementation of distance education for more than three years. The experts were asked a number of questions related to the learning tasks solved through social networks, the characteristics of the VKontakte and Facebook applications for organizing the distance learning process, as well as the methods of combining social networks and an information and organizational distance learning environment. All participants were warned about the purpose of the survey and that the organizers of the study intended to publish the results of the study in a generalized form in the future. All quotes from the experts are cited anonymously in the article.

Results

The expert survey indicated that social networks could be used to solve the following tasks by organizing educational activities at a university in the context of the COVID-19 pandemic (Table 1).

#	Task	%*
1	to organize the collective work of students in and beyond the classroom, which	90 %
	promotes cooperation and gaining experience in teamwork	
2	to expand the organization of student learning at home, because social networks	87.5 %
	allow the use of educational content without time, geographic, and age limits	
3	to ensure the development of the students' personalized learning environment, the creation of their portfolio and educational content of disciplines. If students	85 %
	create the educational content of the discipline together with the teacher, it will be	
	adapted for each student individually.	
4	to promote self-learning of students (implementation of the principles of research-	82.5 %
	based learning)	
5	to promote individual learning of students, because each student needs to work	80 %
	at their own pace	
6	to carry out informal communication between a teacher and a student	80 %
7	to organize an e-journal	75 %
8	to implement the principles of lifelong learning. Students will be able to visit the	75 %
	page of the discipline at any time of the day, download the necessary material,	
	send completed assignments, study online at no cost, and get constant support	
	from the teacher	
9	to carry out an international exchange of experience among teachers	72.5 %

Note: compiled on the basis of the expert survey; * percentage of the expert mentions

Table 1

Learning tasks solved through social networks

According to the experts (90 % of the respondents), the VKontakte network is leading among the modern social Internet networks in the Russian-speaking Internet. The social network Vkontakte includes a list of groups that unite people with scientific interests, including "Communication and joint work of scientists from various countries", "Postgraduate students RU", "Young scientists for young scientists", "Informal communication on scientific topics", "Education and science", etc.

The capabilities of this network, such as applications written and implemented by regular or third-party programmers can be used to expand the functions of the network and organize the distance educational process (Table 2).

#	Applications	Name	Key capabilities
1	for the timetable organization	"Class timetable" (http://vk.com/app71510 5_38097816)	It is used for recording, editing, storing, and sharing the class timetable. Its use is very efficient in informing about timetable changes, as it allows to quickly and easily inform a large audience of users of this application. It has a user-friendly and intuitive interface, quick change of information, and presentation of information in a convenient form of a table indicating the days of the week.
2	for fast text translation and for studying foreign languages	Translate.Ru (http://vk.com/app23063 49_65840683), "Advanced translator" (http://vk.com/app18380 09_65840683)	Translate.Ru is an online translator and dictionary from PROMT for English, German, French, Spanish, Portuguese, Italian, and Russian. It provides information on grammar, transcription and pronunciation of the desired word; therefore, it is efficient in correcting pronunciation. The advantage of the application is that the number of translations is not limited, it has a friendly interface with logical division into a field for the source and target texts, as well as a convenient alphabetical index for finding the necessary information on grammar and a convenient presentation in the form of structural tables. It is useful for assistance with homework and studying foreign languages. "Advanced translator" supports 50 languages, and in addition to the convenience of Translate.Ru it can switch from one translation technology to another, where Bing, Microsoft, and EasySpell technologies are used.

Note: compiled on the basis of the expert survey

Table 2

Characteristics of applications in the social network VKontakte for organizing the distance educational process

According to 85 % of the experts, the Facebook network is leading among the foreign social networks for Russian users.

Facebook has paid a lot of attention to education over the past few years. Many organizations and educational institutions use Facebook to publish news, communicate, attract applicants, etc. In addition, students, teachers, and administrators use a variety of Facebook applications for academic purposes. This is evidenced by various scientific and

pedagogical groups, including Biology, Geology Rocks, Matematika, Science Group, Theoretical Physics, and others. In addition, there are the following pages dedicated to the scientific interests of users: A Moment of Science, California Science Center, National Science Foundation, Popular Science, and Science Careers.

According to the experts, the following applications can be used for the organization of distance learning (Table 3).

#	Application	Characteristics	%*
1	Books termwiki	it helps users share their thoughts on the books they have	60 %
		read	
2	Flashcards	this app allows to create flash cards to help learn on	57.5 %
		Facebook	
3	BookTag	the program offers a great way to share books and create	55 %
		interesting quizzes for learning	
4	DoResearch	intended for collecting information using theses, instructions,	52.5 %
	4ME	etc.	
5	Mathematical	common formulas, solutions, etc.	50 %
	Formulas		
6	SlideShare	it creates presentations to send slideshows to students	50 %
7	Calendar	it helps organize days, set reminders, and share access to	45 %
		the calendar	
8	Zoho Online	for storing and distributing documents on the Internet	45 %
	Office		
9	UdutuTeach	it allows to import courses from myUdutu (course	42.5 %
		development tool);	
10	UdutuLearn	it helps view courses that users have accessed and records	40 %
		their progress	
11	FileShare	application for storing and retrieving documents on Facebook	40 %
12	WorldCat	37.5 %	
		collection and share information with students	
13	Study Groups	this application helps implement a group project	35 %

Note: compiled on the basis of the expert survey; * percentage of the expert mentions Table 3

> Characteristics of the Facebook social network applications for the organization of distance learning

The following applications can be added to this list (less than 30 % of the expert mentions): Springpad, Pinterest, and Evernote for posting notes; Twitter for cross-posting messages from Facebook to Twitter or vice versa; Doc for publishing, sharing, and exchanging documents and photos; Causes for invitations to events; Posterous, LiveJournal, Tumblr, and WordPress.com for interacting with notes on the blog; Trillian, Meebo, Yahoo!, and others for instant messaging; and Yoono as a social media aggregator.

Discussion

The analysis of the results of the expert survey allowed to determine the organizational principles of distance learning using social networks and services.

The experts are proposed to locate the information and organizational distance learning environment on the Internet as a "cloud", where students can get access to its

services. However, as the experts point out, most students have accounts on certain social networks that contain a large amount of data about these students. Students spend a lot of time in these networks, they are used to the means of communication and interfaces. It is advisable to allow them to use the services of the information and organizational distance learning environment in the familiar and comfortable conditions of a social network.

According to the experts, the combination of social networks and distance learning can be implemented using two mutually nonexclusive methods. The first is to integrate various social networking services into distance learning. The second is to create applications on social networks that can interact with distance learning and provide data exchange with the relevant networks. Both methods can be implemented through the application programming interface (API), which is available in most social networks in a fairly advanced form. Let us take a closer look at each method.

1. The method of integrating social networking services into distance learning. The following social services can be integrated into distance learning:

- initial registration and authorization using the existing social media accounts;

- commenting using the existing social network accounts for authorization;

- the "share" function for publishing information and the address of the information and organizational distance learning environment on the student's page in social networks;

 the "share" function used to send information and the address of the information and organizational distance learning environment to someone from the student's friends on the social network;

- organization of voting; and
- the "like" counter.

2. The method of integrating an intermediary program into a social network. It is proposed to create applications in the social networks that will enable data exchange in order to provide access to the distance learning resources to the users of these social networks.

In general, the model of data exchange between the information and organizational distance learning environment and the social network is as follows.

An application using the API of the social network is integrated into this network. When installing the application, the user consents to access public information. The application exchanges data with the information and organizational environment using the application layer protocols of the TCP/IP stack.

When a user works with various distance learning resources using the method of integration of an intermediary program into a social network, the data are exchanged in a two-way mode. These resources include services of the electronic dean's office, traditional distance learning courses, massive public training courses, course design tools, storage of media resources, simulators for self-training, virtual laboratories, thematic virtual tours, base of links to internal and external Internet resources, various means of communication

(forums, chats, webinars, video conferences, voice conferences with other participants in distance learning, including those who are not on the student's social network), means of multilingual communication, "live" webcams installed in public places of the university, means of finding the "ideal companion", and other resources.

The personal data are exchanged between the social networking application and the information and organizational environment in a two-way mode as well. The application sends data about the student, photos and videos saved in their account, the number of views and comments on photos and videos, posts from their "wall", data about their friends, and other public data. This information is used to fill the database of the information and organizational environment.

The information and organizational environment can modify some of the student's data (status, events, notes, etc.) and add new data (photos, videos, posts on the "wall", posts on the "wall" of the student's friends, etc.) through the application. It is advisable to modify and add data in order to post educational information, inform about events, and promote the university.

Students will be able to access most of the information and organizational environment functions in several ways. For example, the user can go through the initial registration and authorization both directly in the information and organizational environment and with the participation of the social network as an intermediary. In the case of using the existing account on the social network, the user does fewer mechanical actions, they are performed by the social network (the confirmation will be provided automatically if the authorization data on the social network are saved in the user's browser).

Conclusion

As such, social networks have a number of advantages as a means of distance learning in the context of the COVID-19 pandemic: these are high accessibility and a free alternative to expensive social learning platforms for higher education institutions; social networks are most often easy to use and intuitive for teachers and students; for students, learning can be immediately aimed at studying the actual material of the course, rather than at studying the technology of using the learning environment; they contain ample learning tools, including videos, images, discussion boards, chats, and private messages; the advantages of social networks can be combined with the advantages of other social services through their integration through applications; teaching materials are available 24/7; and learning events can be scheduled in real time, facilitating instant and consistent interaction and discussion among students of the same course.

Social networks cannot replace distance learning systems, but their synergy within the information and organizational distance learning environment can significantly increase communication capabilities, evoke the interest of students, and promote more active participation in the educational process. The combination is possible through the integration of social services into the information and organizational environment and the integration of the intermediary program into the social networks, using the conceptual model of data exchange with the information and organizational environment presented in the article. The list of the information and organizational environment resources for organizing access to them through social networks has been provided.

Synergy increases the convenience of using the information and organizational distance learning environment, provides students with the opportunity to use the information and organizational environment resources in the conditions familiar for them, promotes universities, and allows to automatically perform some mechanical user actions. The proposed methods and conceptual model of the data exchange between social networks and the information and organizational environment can be used to combine social networks with almost any distance learning systems.

As such, the following hypothesis of the study has been confirmed: the use of social networks in teaching students in the context of the COVID-19 pandemic is possible through the integration of social networking services and an information and organizational distance learning environment.

The prospects of further research are to carry out a detailed study to find out the best platform for implementing distance learning, to explore ways of leveling the negative influences of social networks on the personality of students, and to prove that the learning process carried out in a comfortable and familiar environment is likely to be successful due to a higher degree of motivation.

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