

Virtual Universities in the Educational Space: The Relationship between Development Strategies and Models

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Abstract

The development of global university education shows that new models of universities are being formed under the influence of modern computer and telecommunications technologies, as well as the development of market relations in the field of education, one of which is the virtual university model.

The purpose of the article is to identify strategies and models for the development of a virtual university in the modern educational space.

The article presents the components of the virtual university model; defines the tasks that need to be solved when creating a virtual university model, as well as the strategic directions of the virtual university; highlights the educational advantages of the virtual university.

It has been shown that there is a relationship between the main strategic directions of the virtual university and the tasks that need to be solved when creating a virtual university model.

Keywords

Virtual University, University Education, Distance Education, Virtual Learning Process, Internet.

Introduction

Knowledge becomes the most important factor of social development in the information society. For most developed countries, the pace of basic long-term economic growth depends on the support and expansion of the global knowledge base, which has become possible in the information society.

The information society requires a new level of education and new approaches to its provision and receipt. A modern higher education institution should promptly change the training courses, the methods of teaching these courses, and provide for changes in the requests of consumers of educational services. International experience shows that higher education institutions, and especially universities, are no longer tied to the locality, the concept of cyclical training disappears, instead of a specialty, there is now a list of courses required for obtaining a qualification (Abdoli-Sejzi, Aris, Yahaya, 2009).

New educational technologies are developing more and more. They led to the creation of distance learning and a new generation of educational institutions – virtual (electronic) universities (Luis, González, 2013), which should make education more accessible and raise it to a qualitatively new level. Thus, education comes to every home, regardless of distance and location in space. The principles of open education – "freedom in time" and "freedom in space" – have been approved (Pigliapoco et al., 2008). The introduction of ICT and distance learning allows removing barriers associated with physical distances, bringing education closer to consumers (Akhshabi, Khalatbari, Akhshabi, 2011).

Based on computer technologies, virtual education is actively developing, which forms a qualitatively new communication in terms of semantic characteristics, in the context of which a symbolic dynamic image of a person – a specialist, capable of repeatedly changing in the process of professional and personal communication, has been formed (Evans, Ping Fan, 2002; Muratova et al., 2021). Virtual education contributes to the change and deepening of the internal qualities of real subjects of the educational process (student, teacher), which occur as a result of their joint interaction (virtual educational process).

Open education in many countries of the world is a system that can provide nationwide access to educational resources by using information educational technologies of distance learning and then makes it possible for citizens to exercise their rights to education that meets the quality requirements of the modern labor market and civil society.

Literature Review

One of the trends in the development of university education is the use of "virtual reality" ICT technologies (Boulton, Kent, Williams, 2018; O'Donoghue, Singh, Dorward, 2001) and the organization of open virtual education systems (Bradley, Oliver, 2002). In particular, this applies to distance education, the main advantages of which are low costs for the installation and maintenance of the training system (Anzai, 2009); speed and high quality of educational services (Stallings, 2002); convenient and effective level of assessment of acquired knowledge and independent work (Alvarez, 2019); providing access to the system from the Internet (Basu, Bhattacharya, Roy, 2013), which makes it possible to participate in the educational process from anywhere in the world, contributes to the competitiveness of the educational institution, and so on. In the late 90s of the 20th century, a new organizational form of modern education emerged based on distance education in the European educational environment – a virtual university (Le Beuxa, Fieschib, 2007).

The essence and concept of a virtual university are described in numerous studies (Table 1).

Table 1 The essence and concept of a virtual university

No.	Definitions	Source
1	The essence of the virtual university is not only in remote learning, but also its independence from any institution	O'Donoghue, Singh, Dorward (2001)
2	the virtual university is not tied to the area (there is a refusal of universities from geographical names), the concept of cyclical training disappears, since it is possible to start training from any period; there are no faculties, but there is a list of courses necessary for obtaining qualifications, for the development and provision of which accredited educational institutions are involved, courses are delivered via the Internet computer network using audio and video recordings	Bradley, Oliver (2002)
3	a higher education institution based on the collaboration of administrators, course developers, teachers, technologists, and students who are separated by large distances, often national borders, but who work together using modern telematics technologies	Le Beuxa, Fieschib (2007)
4	the virtual university does not have academic buildings, campuses, dormitories, administrative offices, assembly halls, but issues diplomas and certificates, as well as confers academic degrees	Yengin, Karahoca, Karahoca, Uzunboylyu (2010)
5	a server with a multi-faceted software environment to support teaching via the Internet or Intranet, based on which the distribution of educational material is carried out using a regular web browser, such as MS Internet Explorer, Mozilla Firefox, or Opera	Abdoli-Sejzi, Aris, Yahya (2012)
6	A training system without a physical and technical location, technical support, and image. It is the integration of information technologies, computer systems, and communication tool systems to support distance education. Virtual universities provide the infrastructure that enables students to gain educational experience and related support partially or fully online	Richards (2015)

Therewith, virtual universities can provide training in many or some specialties (Engelhardt-Nowitzki et al., 2019), exist as a separate online platform (Abdoli-Sejzi, Aris, 2012), or be a virtual stand-in for a traditional university (Shahtalebi, Shatalebi, Shatalebi, 2011).

The analysis of the scientific and methodological literature revealed that the problem of strategies and models for the development of a virtual university in the educational space is not solved and requires further development. In particular, the issues of describing and interrelating the components of the virtual university model, defining the tasks when creating a virtual university model, determining the strategic directions of the virtual university and its educational advantages in comparison with traditional universities need to be addressed.

Research hypothesis: there is a relationship between the main strategic directions of the virtual university and the tasks that need to be solved when creating a virtual university model.

Methods

Research Model

At the first stage of the study, the sources of information necessary for the implementation of the research goal were selected:

The first group of sources: articles published in journals indexed by Scopus and Web of Science, and speeches at conferences of researchers from different countries, containing conceptual provisions regarding the virtual university as a form of organizing the educational process;

The second group of sources: articles published in journals indexed by Scopus and Web of Science, and speeches at conferences of researchers from different countries, devoted to the foreign experience of strategies for the development of virtual universities.

At the second stage of the study, considering the existing limitations in the application of the document analysis method (the quality of the selected sources, their completeness, and the subjective positions of the authors), we conducted an expert survey (by e-mail) to assess the reliability of the selected sources.

The criteria for selecting experts (26 people) were the presence of articles on this topic published in journals included in the Scopus or Web of Science citation databases in the

number of at least 3 or work experience of at least 10 years in higher education institutions.

The experts evaluated the list of sources on the Harrington scale and rated the selected documents on average at a high level (0.64-0.8).

At the third stage of the study, the analysis of the collected information was carried out, with the interpretation of the results obtained.

Methods

To achieve this goal, the following methods were used:

Comparative pedagogical analysis and generalization of theoretical sources to reveal the conceptual provisions regarding the virtual university as a form of organization of the educational process;

Generalization and systematization of research results on the foreign experience of virtual university development strategies, the use of which will contribute to the introduction of innovative systems and technologies in the Russian educational space.

Results

Based on the analysis of the scientific literature, we will identify the main components of the virtual university model and related components (Table 2).

Table 2 Components of the virtual university model

No.	Main components	Related components	Sources
1	intranet portal for organizing employee access to ICT	distance education portal	Luis, González (2013); O'Donoghue, Singh, Dorward (2001); Stallings (2002)
2	intranet portal for organizing students' access to ICT	social communities	Luis, González (2013); O'Donoghue, Singh, Dorward (2001); Stallings (2002)
3	public website	electronic library	Alvarez (2019)
4	e-learning system	virtual educational environment	Alvarez (2019)

When creating a virtual university model, it is necessary to solve the following main tasks (Table 3).

Table 3 Tasks for creating a virtual university model

No.	Tasks	Sources
1	creation of the material and technical base of the IT infrastructure (local, corporate networks with access to the Internet)	Akhshabi, Khalatbari, Akhshabi (2011); Abdoli-Sejzi, Aris, Yahya (2012); Engelhardt-Nowitzki, Pospisil, Otrebski, Zangl (2019)
2	automation of university management, document management, the interaction of various departments of the university	Bradley, Oliver (2002); Alvarez, (2019), Abdoli-Sejzi, Aris, Yahya (2012)
3	informatization of the educational process, creation, and use of a virtual educational environment, use of e-learning, m-learning (mobile learning), u-learning (ubiquitous learning), b-learning (blended learning), f-learning (free learning)	Luis, González (2013); Alvarez (2019); Savoji (2013)
4	systematic professional development of teachers in the field of ICT	Abdoli-Sejzi, Aris, Yahya (2012); Lee, J., Hsu, K.-H. 2002

Analysis of scientific literature and experience of European institutions of higher education (Luis, González, 2013; O'Donoghue, Singh, Dorward, 2001; Alvarez, 2019; Yengin et al., 2010) allowed formulating the main strategic directions of the virtual university (Table 1). 4), directly related to the tasks of creating a virtual university model.

Table 4 Strategic directions of the virtual university activity

No.	Strategic directions of the virtual university activity	Sources
1	to promote cognitive and effective learning of students' knowledge, skills, and values and promote the use of this knowledge in professional activities	Akhshabi, Khalatbari, Akhshabi (2011); O'Donoghue, Singh, Dorward (2001); Abdoli-Sejzi, Aris, Yahya (2012)
2	to develop competence in communication, critical thinking, collaboration, and the use of information, as well as a commitment to lifelong learning to empower students for career success	Basu, Bhattacharya, Roy (2013); Shahtalebi, Shatalebi, Shatalebi (2011)
3	to provide instruction that bridges the gap between theory and practice, through teachers who bring to their audience not only active academic training but also skill-building	Boulton, Kent, Williams (2018); Engelhardt-Nowitzki, Pospisil, Otrebski, Zangl (2019); Hendricks (2012)
4	to provide general education and foundational instruction and services that prepare students to participate in the university's various academic programs	O'Donoghue, Singh, Dorward (2001); Alvarez (2019); Savoji (2013)
5	to use technology to create effective learning modes and tools that expand access to learning resources and improve interaction and communication to improve student learning	Luis, González (2013); Le Beuxa, Fieschib (2007); Abdoli-Sejzi, Aris, Yahya (2012)
6	to evaluate training programs, training organization, training resources, counseling, and other educational services for students	Le Beuxa, Fieschib (2007); Akhshabi, Khalatbari, Derakhshan, Akhshabi (2011)
7	to promote a spirit of innovation that focuses on providing academic quality, service, excellence, and convenience to the student	Basu, Bhattacharya, Roy (2013); Engelhardt-Nowitzki, Pospisil, Otrebski, Zangl (2019); Abdoli-Sejzi, Aris (2012)

Discussion

As the analysis of scientific literature has shown, the main feature of a virtual university is virtual education, the creation of a virtual educational environment, which is understood as an environment that promotes the emergence and development of information and educational interaction between students, teachers, and the means of new information technologies, as well as the formation of cognitive activity of students, provided that the components of the environment are filled with the subject content of a certain educational course (Basu, Bhattacharya, Roy, 2013). The existence of a virtual educational space outside the communication of teachers, students, and educational facilities is impossible (Abdoli-Sejzi, Aris, Yahya, 2012).

The virtual representation of an educational institution is a software package that provides the implementation of a large set of service functions that make it possible to enter an educational institution, receive education in this educational institution, being at a certain distance from it, by using the Internet computer network to complete all stages of training (Evans, Ping Fan, 2002).

The key features of the virtual educational process are preliminary uncertainty for the subjects of interaction; uniqueness for each component of their interaction; existence only during the interaction itself. Training modules can be in multimedia form, that is, in addition to texts, they can contain images, photos, video clips, audio recordings, literary or hypertext links (Stallings, 2002).

The potential opportunities for restructuring the education system are realized with the help of educational teleconferencing technologies in the virtual university as an educational model. This allows students (individually, collectively) to meet and communicate with teachers and each other, from any distance. Such modern means of communication are supplemented by computer-based educational programs such as multimedia, which replace printed texts, audio, and videotapes. As a result, students can receive educational information from different sources (Shahtalebi, Shatalebi, Shatalebi, 2011).

An analysis of the scientific literature and the experience of European institutions of higher education provides grounds for concluding about the educational advantages of a virtual university (Table 4).

Table 4 Educational Benefits of a virtual university

No.	Advantages of a virtual university	Sources
1	compliance with educational standards and quality assurance of education	Abdoli-Sejzi, Aris, Yahaya (2009); Yengin, Karahoca, Karahoca, Uzunboylu (2010); Savoji (2013)
2	the possibility of constant updating of educational materials and forms of training; the involvement of various specialists, teachers from different countries, and educational institutions	O'Donoghue, Singh, Dorward (2001); Engelhardt-Nowitzki, Pospisil, Otrebski, Zangl (2019); Shahtalebi, Shatalebi, Shatalebi (2011)
3	providing education in the shortest possible time; attracting a significant number of students to study, specialists to improve their skills, receive education	O'Donoghue, Singh, Dorward (2001); Stallings (2002); Yengin, Karahoca, Karahoca, Uzunboylu (2010)
4	the possibility of simultaneous training and professional activities that ensure career growth; an incentive for continuous professional development of teaching staff of the educational institution	Boulton, Kent, Williams (2018); Bradley, Oliver (2002); Shahtalebi, Shatalebi, Shatalebi (2011)
5	the efficiency of material and financial support; significant savings in funds and expenses on the material and technical base, training; the ability to use modern training technologies, participation in a variety of projects	Anzai (2009); Engelhardt-Nowitzki, Pospisil, Otrebski, Zangl (2019); Lee, Hsu (2002)
6	open access to study at leading universities, regardless of the place of residence	Bradley, C., Oliver, M. 2002, Basu, P., Bhattacharya, S., Roy, S. 2013, Savoji, A.P. 2013
7	the possibility of the optional study of disciplines based on the curricula of other universities and original author's courses presented in a virtual environment	Anzai (2009); Yengin, Karahoca, Karahoca, Uzunboylu (2010)
8	providing students with interactive mentoring support	Hendricks (2012)
9	creating a well-developed virtual infrastructure that includes electronic libraries, job databases, participation in electronic conferences, etc.	Bradley, Oliver (2002); Basu, Bhattacharya, Roy (2013); Abdoli-Sejzi, Aris, Yahya (2012)
10	formation of study groups continuously throughout the year; individual training plan with the possibility of academic breaks in training.	Boulton, Kent, Williams (2018); Yengin, Karahoca, Karahoca, Uzunboylu (2010); Shahtalebi, Shatalebi, Shatalebi (2011)

Speaking about virtual universities as the main conductors of virtual education, it should be noted that, according to researchers (Abdoli-Sejzi, Aris, 2012), according to the degree of use of virtual education systems in international practice, two directions can be determined:

- Educational institutions based on the use of Internet technologies. The selection of the course, its payment, classes with students, the transfer of control tasks and their verification, as well as the passing of intermediate and final exams are carried out exclusively through the world wide web. This area is actively developing, its advantages are indisputable (for example, the Virtual Faculty at the Technical University in Ostrava (Czech Republic), the Dutch Open University, the Catalan Open University (Spain)) and others);
- Educational institutions that combine various traditional forms of full-time and distance learning with technological innovations on the Internet (using language classes to learn foreign languages without a teacher, for example, at the Higher School of Economics in Prague (Czech Republic)).

One of the trends that have been developed in different countries of the world is the emergence of national virtual universities funded by national governments. According to researchers (Abdoli-Sejzi, Aris, Yahaya, 2009), the creation of national virtual universities allows governments to concentrate high-quality technical and human resources; focus the efforts of the virtual university on the urgent needs of the national labor market or education system; use and develop the existing infrastructure of Internet technologies; support the development of e-learning in traditional educational organizations; ensure the advantages of national e-learning programs over foreign ones; export e-learning educational programs to other countries in national languages, which can reimburse part of the costs of creating these programs.

There are also private universities, as well as corporate virtual universities along with public virtual universities. These universities respond quickly to the needs of students, and the success of their activities depends on the price-quality ratio of education, as well as the recognition of learning outcomes by employers. In some countries, private virtual universities receive public funding either through direct grants, research funds, or student loans (Anzai, 2009). One of the most famous private virtual universities is the American University of Phoenix (The University of Phoenix (UoP)), founded in 1976 (Bradley, Oliver, 2002). The popularity of the university is explained by the cost of training, which is five to six times lower than in traditional American institutions of higher education.

Conclusion

In education, an active search for new forms of learning has begun, leading of which are distance learning, transnational learning, and virtual education based on the use of network information technologies. The virtualization of education opens up

fundamentally new opportunities for solving the current problems of modern society – increasing access to high-quality openness of education; the possibility of a lifelong learning process. Virtualization of the training system is effectively implemented and distributed in the developed countries of the world.

Virtual universities complement the system of traditional full-time and part-time education, in which learning is transferred to a virtual educational environment. The learning process is carried out with the help of ICT and network technologies from any place and at any time. In addition, modern ICTs are successfully integrated into the traditional educational process, providing an opportunity to achieve the goal of training and improving the skills of specialists. Building a virtual university allows partially or completely transferring all educational processes to a virtual environment: distribution of materials, publication of news, communication between students in the classroom, individual communication between students and teachers, etc.

The results of the study confirmed the hypothesis that there is a relationship between the main strategic directions of the virtual university and the tasks that need to be solved when creating a virtual university model.

References

- Sejzi, A.A., & Bin Aris, B. (2012). Constructivist approach in virtual universities. *Procedia-Social and Behavioral Sciences*, 56, 426-431.
- Abdoli-Sejzi, A., Aris, B., & Yahaya, N. (2009). An investigation of virtual universities in developed and developing countries: importance and necessity. *The proceeding of Educational postgraduate research seminar (Edupres)*, 1, 84-93.
- Sejzi, A.A., Aris, B., & Yahya, N. (2012). The phenomenon of virtual university in new age: trends and changes. *Procedia-Social and Behavioral Sciences*, 56, 565-572.
- Akhshabi, M., Khalatbari, J., & Akhshabi, M. (2011). An experiment on conducting mobile learning activities on the virtual university. *Procedia-Social and Behavioral Sciences*, 28, 384-389.
- Akhshabi, M., Khalatbari, J., Derakhshan, A., & Akhshabi, M. (2011). Educational standard content design system for virtual university. *Procedia-Social and Behavioral Sciences*, 28, 855-861.
- Alvarez, X.P. (2019). The virtual collaborative work and the development of intercultural competences in university student's: The case of Virtual Global Teams. *In Proceedings of the Seventh International Conference on Technological Ecosystems for Enhancing Multiculturality*, 738-744.
- Anzai, Y. (2009). Digital trends among Japanese university students: Podcasting and wikis as tools for learning. *International Journal on E-learning*, 8(4), 453-467.

- Basu, P., Bhattacharya, S., & Roy, S. (2013). Online recommendation of learning path for an e-learner under virtual university. *In International conference on distributed computing and internet technology*, 126-136.
- Boulton, C.A., Kent, C., & Williams, H.T. (2018). Virtual learning environment engagement and learning outcomes at a 'bricks-and-mortar' university. *Computers & Education*, 126, 129-142.
- Bradley, C., & Oliver, M. (2002). The evolution of pedagogic models for work-based learning within a virtual university. *Computers & Education*, 38(1-3), 37-52.
- Evans, C., & Fan, J.P. (2002). Lifelong learning through the virtual university. *Campus-Wide Information Systems*, 19(4), 127-134.
- Hendricks, N. (2012). An E-Learning Collaborative Environment: Learning within a Masters in Education. *International Journal on E-Learning*, 11(1), 39-53.
- Le Beux, P., & Fieschi, M. (2007). Virtual biomedical universities and e-learning. *International journal of medical informatics*, 76(5-6), 331-335.
- Lee, J., & Hsu, K.H. (2002). Modeling software architectures with goals in virtual university environment. *Information and Software Technology*, 44(6), 361-380.
- Luis, P.S., & González, W.I.G. (2013). Three-Dimensional Interactive Virtualization of University Buildings and Spaces. *Procedia Computer Science*, 25, 411-419.
- Muratova, A.N., Shara Mazhitayeva, B.Z., Sarybayeva, A., & Kelmaganbetova, Z.K. (2021). Non-Verbal Signs and Secret Communication as Universal Signs of Intercultural Communication. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 13(1). <https://dx.doi.org/10.21659/rupkatha.v13n1.35>
- O'Donoghue, J., Singh, G., & Dorward, L. (2001). Virtual education in universities: a technological imperative. *British Journal of Educational Technology*, 32(5), 511-523.
- Pigliapoco, E., Torrisi, G., Messina, M., & Bogliolo, A. (2008). LoL Classroom: A Virtual University Classroom Based on Enhanced Chats. *European Journal of Open, Distance and E-learning*, 11(2).
- Richards, G. (2015). *A Guide to Virtual Universities for Policy-Makers*. Burnaby, British Columbia Canada: Commonwealth of Learning, 42.
- Savoji, A.P. (2013). Motivational strategies and academic achievement in traditional and virtual university students. *Procedia-Social and Behavioral Sciences*, 84, 1015-1020.
- Shahtalebi, S., Shatalebi, B., & Shatalebi, F. (2011). A strategic model of virtual university. *Procedia-Social and Behavioral Sciences*, 28, 909-913.
- Stallings, D. (2002). Measuring success in the virtual university. *The Journal of Academic Librarianship*, 28(1-2), 47-53.
- Yengin, İ., Karahoca, D., Karahoca, A., & Uzunboylu, H. (2010). Re-thinking virtual universities. *Procedia-Social and Behavioral Sciences*, 2(2), 5769-5774.
- Fazal, N., Nguyen, K.Q., & Fränti, P. (2019). Efficiency of web crawling for geotagged image retrieval. *Webology*, 16(1), 16-39.