E-learning in higher inclusive education: needs, opportunities and limitations

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Abstract

Purpose – The purpose of this paper is to study the limitations, opportunities and conditions for the development of e-learning in the inclusive education system in the universities.

Design/methodology/approach – The paper reviews the literature dedicated to e-learning, its application and adaptation in higher inclusive education. Systemic and social approaches were applied to the perception of higher inclusive education for the purposes of this study. The principles of evolutionary economics and institutional theory were used for determining the possibility of using e-learning in higher inclusive education. The findings are confirmed by an empirical study of the integration of e-learning into the higher inclusive education system by the example of Russia.

Findings – It has been shown that the development of e-learning in the national higher education system and its perception by the higher inclusive education system depends on the level of development of social and information interrelation in the society. In addition, e-learning can only be used in higher inclusive education when it is interrelated with traditional learning. The efficiency of e-learning in higher inclusive education depends on the systemic institutional environment which was formed both at the level of the state and at the level of a particular university. In this case, the institutional environment should be focused not only on the development of e-learning and inclusive education, but also on their collaboration.

Practical implications – The results of the study, which identified special aspects, opportunities and limitations of e-learning in higher inclusive education, can be applied to improve its effectiveness both at the level of individual universities and at the level of formation of national strategies for the development of higher education.

Originality/value – Given the growing relevance of higher inclusive education in the contemporary world and the limited number of studies of adaptation and the use of e-learning in it, the results obtained can contribute to the implementation of strategic planning of this direction at the national and local levels.

Keywords University, E-learning, Institutional environment, Higher inclusive education

Paper type Research paper

1. Introduction

A new stage of scientific and technological progress, embodied in the digital economy, involves many counterprocesses. On the one hand, it is the constant development of new technologies, devices, interfaces; on the other hand, it is the need for social interaction, integration and formation of a new way of thinking. The inevitability of reflecting these processes in the higher education system is due to its role as the most important social institution influencing the level of development of the national economy and social progress in general. Today, the need for implementation of digital technologies into the educative process raises no doubt at all, since the digital environment offers greater freedom of choice in learning, reducing costs for it and increasing the rate of information transfer. The digital environment also influences the development of e-learning, complementing it with new technologies and methods. In addition, the advantages of e-learning determine high demand for it in solving important social problems (Martins and Nunes, 2016a), in particular, overcoming the inequality of the physical capacities of the students. Today, e-learning is actively used in inclusive education aimed at education of people with disabilities. However, inclusive education, by virtue of its specific character, has special requirements for the
mechanisms and principles of learning and e-learning in particular. The national strategy for the development of education (Gaebel et al., 2014) and the changes in global digital space (Mozhaeva, 2016) have overall significantly influenced the development of e-learning in inclusive education as well. Therefore, one should assess the prospects and establish the limits for the use of e-learning in inclusive education, taking into account the national institutional conditions. Such statement of the question is an attempt to expand the e-learning concept and its applicability in inclusive education. At the same time, it is necessary to rely on the perception of the dual nature of e-learning, which, on the one hand, has a progressive beginning (McPherson and Nunes, 2008) which influences the development of the entire higher education system, on the other hand, which is a destructive form of innovations (Hardaker and Singh, 2011) in the universities. Perception of dichotomous content of e-learning, intensified by the influence of national institutional policy (Parchoma, 2009), can play an important role in the development of inclusive education practices in the universities. The intensification of the presented theoretical conclusions is facilitated by their intensification with empirical data, which in this paper are mainly focused on the experience of the Russian universities.

Thus, the purpose of this paper is to study the limitations, opportunities and prospects of e-learning in the inclusive education system in the universities.

2. Materials and methods of study
The issues of development of inclusive education are particularly pressing in the contemporary society, as evidenced by the growing research on this topic relating to the field of education (Textor, 2015), and to the economy and philosophy, as well as its cultural space (Adrienne, 2004). This study is focused on the analysis of opportunities, limitations and prospects of e-learning as a direction for the development of the educational environment in the universities for the students with disabilities. Socially centered approach (social model) (McGibbon, 2012) served as a conceptual framework for the consideration of higher inclusive education for the perception of limited health capacity of a person. This study is based on a systemic approach (Kornai, 2002; Zakovorotny et al., 2016) to the perception of higher inclusive education and e-learning. Besides, this study is based on the principles of consolidation of evolutionary economics (Popkova and Tinyakova, 2013) and institutional theory (Freeman, 1987), according to which the institutions that have the maximum set of favorable properties promote the effective development of society and economy, remain and get further development. Knowledge approach (Nonaka and Takeuchi, 1995), structuring of the forms of knowledge within its framework, allowed to analyze the benefits and limitations of the use of e-learning in higher inclusive education.

The study of the development of e-learning in higher inclusive education by the example of Russia confirmed the significance of the institutional environment for intensification of the effects of their synthesis.

3. Findings
3.1 Evolution of e-learning in higher education: factors and needs
The educational system, designed to be constantly updated in accordance with the demands of society, has always been in search of the most progressive teaching modes. Thus, in Europe, at the end of the eighteenth century, with the emergence of affordable postal communications, a “correspondence study” arose, which involved remote learning. Its further transformation into online education received rapid development in the twentieth century. In accordance with the genealogical investigation by M. Laanpere (Laanpere, 2000; Laanpere et al., 2006), it is online education that is the basis of the
development of e-learning. Nevertheless, online learning and e-learning are not identical. According to UNESCO, e-learning should be treated as the process of education through the use of internet and multimedia. A unique feature of online learning consists in the remote interaction between the teacher and the student, which is not an obligatory criterion for e-learning. And though contemporary online education is based on the use of information telecommunication technology, it is not a criterial attribute for them. The distance (remoteness) between the teacher and the student is not a criterial attribute for e-learning as well. The boundaries between the perception of e-learning and online learning have blended at present, since online learning is virtually impossible without the use of IT. In this study, e-learning should be understood to mean learning with the use of information telecommunication technology, and it can involve interaction between the teacher and the students both in the online mode (synchronous learning) and in time-lagged mode (asynchronous learning or self-paced learning) (Hrastinski, 2008). The emergence of synchronous form of e-learning in the 1990s of the twentieth century became possible thanks to the internet.

E-learning has gone through several stages in its development (Imran and Malik, 2017). Initially, e-learning was considered as a technical improvement of online education, in other words, its technical support. However, soon there arose a need for the purposeful design of education courses, their adaptation to the online environment. This led to the need for the development of pedagogical design and technological standards, which subsequently took shape of the learning management system (LMS) and learning content management system (LCMS) (Fita et al., 2016). Since e-learning is in direct interrelation with the development of information and communication technologies, its evolution can be traced in accordance with the development of the internet (web), change in its design, structure and content. The evolution of e-learning in accordance with web development is shown in Figure 1.

In conformity with the changes in the internet from Web 1.0 to Web 4.0 in the foreseeable future, shown in Figure 1, we can also present the transformation of the

![Figure 1. Evolution of web and e-learning](image-url)
e-learning system: E-learning 1.0, which today is gradually transforming into E-learning 3.0 (Deliyska and Manoilov, 2010), and subsequently, into E-learning 4.0. Let us give a brief description of the stages of the development of e-learning shown in Figure 1:

- E-learning 1.0, based on Web 1.0, a read-only information network for web-static pages, provides only content, and the educational process here is similar to a lesson given by the teacher where the students receive what is presented to them. At this stage, LMS and LCMS are used to create, develop and manage courses, as well as for access to content, user registration, monitoring and certification tools. The Learning Object (Beck, 2009) mainly takes the center stage in this system, rather than the educative process as such.

- E-learning 2.0 is based on Web 2.0, which makes it possible to inform people, cooperate with them and socialize them with each other to some extent. Semantic Web, which is the foundation of Web 2.0, implies a generally accessible global network based on the standardization of the information provided. Accordingly, E-learning 2.0 is based on the teamwork, for example, on a particular project via social networks, or in group workspaces or communities. The concept of social learning of Bandura (1977), which is the foundation of E-learning 2.0, assumes that people learn from each other through observation, simulation and modeling. In addition to LMS and LCMS, E-learning 2.0 includes blogs, e-portfolio of the student and social networks (VKontakte, Facebook, etc.). Since 2008, there is a new digital practice – mass open online courses (Mozhaeva, 2016), for example, Coursera, Udacity and OpenEDU, the popularity of which is noted even at the present day.

- E-learning 3.0 is accordingly based on Web 3.0, and as a continuation of Web 2.0 it allows creating high-quality content and services on the basis of it. Mobile internet and mobile learning established on the basis of it, applied cloud technologies, learning based on augmented reality (AR) and virtual reality (VR) technologies constitute E-learning tools 3.0.

- The proposed stage of further development is E-learning 4.0, based on Web 4.0 or NeuroNet. Web 4.0 is based on the neurocommunication principle backed by the idea of capability of human intelligence amplification (Jones, 2006) by analogy with the increase in physical strength. The key principles of E-learning 4.0 are perceived to be self-learning and self-organization.

The popularity of e-learning can be evidenced by the fact that more than 40m students around the world have used online mode of study today (Crea and Sparnon, 2017). Rapid development of e-learning at the present time is also evidenced by the figures of the international e-learning market. Thus, its average growth for five years was 9.2 percent. That said, the highest rate of e-learning market growth can be observed in the countries of Asia and Eastern Europe: China (52 percent), Malaysia (41 percent), Romania (38 percent), Poland (28 percent) and Czech Republic (27 percent). It should be noted that public policy exerts certain influence on the development of e-learning. Thus, although there is no independent strategy for the development of e-learning in Romania, Poland and Czech Republic, there is support at the state level. In general, according to the forecast, the international market of e-learning will grow approximately by 7.2 percent per year, and will reach approximately $325bn by 2025 (Global E-Learning Market Analysis & Trends, 2017). The growth of the market of educational services provided with the use of handheld devices reached $5.3bn in 2012, and its future growth can be observed. At the same time, there is a negative annual rate of market growth self-paced learning, the attributes of which mainly belong to Web 1.0 and Web 2.0. Thus, in 2016, this figure was −6.4 percent (The 2016-2021 Worldwide Self-paced eLearning Market, 2016). Only the growth rate of this market in the
countries of Africa has positive value. Inference should be drawn that the technologies that serve as the foundation of E-learning 2.0 gradually become irrelevant and are being supplanted by mobile learning, AR/VR and other E-learning tools 3.0.

What factors are the foundation of the development of e-learning? Since web transformation is based on informational and social interrelation (Figure 1), it is quite appropriate to say that the advances in information technologies and the development of social interrelation have a determining effect on the evolution of e-learning. The accessibility of information technologies, their focus on social collaboration and the ability of the existing social environment to perceive them are the main components of the successful development of e-learning. The pursuance of flexibility, increased information security and accessibility e-learning serve as the foundation of its transformation.

The apparent advantages of e-learning for higher education include, in particular, saving of time and costs for learning, flexibility and accessibility of the learning mode, ease of actualization of educational material, transparency of the educative process, rapid availability of statistics for the analysis of the results. Besides, the nonlinear nature of learning, which is based on the use of special methods, forms the student’s ability to perceive the necessary information in the proper place and at proper time. On the other hand, e-learning in the universities can be perceived as a disruptive innovation, and its implementation can cause resistance on the part of the teachers (Martins and Nunes, 2016b). Raised demands associated with the implementation of the e-learning process, in the absence of institutional incentives and impetuses, far too often lead to the comprehension of the inexpediency of implementation of e-learning on the part of the teachers (Loureiro-Koechlin and Allan, 2010). In this regard, the definition of boundaries and opportunities of using e-learning in higher education is of interest.

3.2 The role of e-learning in inclusive education, its limitations and prospects
E-learning, thanks to its flexibility, performs an important social function, making education accessible to various social groups. The advantages of e-learning in educational systems of many countries were also aimed at solving the problems of individuals with disabilities, in particular, on the development of inclusive education. Inclusive education is a new stage of development of education, assuming its accessibility for students with disabilities in terms of adapting it to their various needs. The development of inclusive education in the present context is primarily caused by the increase in the number of people with disabilities. Thus, according to the statistics of the World Health Organization, people with disabilities throughout the world make up 23 percent of the total population of the planet, which amounts to more than 1bn people. The individuals with disabilities who want to obtain a certain profession, professional skills and, hence, to obtain higher education, also need support and special conditions of learning and development. The education is inherently valued much higher by individuals with disabilities than by other people who have no significant health problems. The education, especially higher education, is a special social resource of paramount importance for them, as it has a persistent effect on the reduction of their isolation and economic dependence. In this case, the task of the universities is not only to establish and develop a special social and cultural infrastructure in an educational institution (Mitchell, 2005), but also to improve the teaching techniques and methods which must guarantee the students that limited health capabilities will not be the main barrier in their subsequent professional life.

The mere idea of inclusion in education implies that it is not the student who should prepare to the integration into the educational system, but the system itself must be ready to the integration of any student. And although the first projects in the implementation of ideas of inclusive education appeared as early as in the 1970s of the twentieth century, it acquired more systemic outlines a little later: in the USA – in the 1980s, and in the countries of
Europe – since the early 1990s of the twentieth century. At present, the inclusive education attracts particular attention in the countries of Western Europe, Scandinavian countries, in the USA, as well as in Canada, Japan, Australia and New Zealand. There are various models for the support of inclusive education in the universities. Among them, one can distinguish targeted support for students with disabilities (e.g. in Great Britain) and support from the universities (educational institutions) which provide education for the disabled (e.g. in Sweden). The proportion of students with disabilities among the agemates with disabilities (18–30 years old) in different countries is shown in Figure 2. Moreover, the proportion of students with disabilities tends to increase.

However, any approach to inclusive education is based on the social model of integration into the social relations of individuals with disabilities (Armstrong and Barton, 2007). The main features of inclusion, in accordance with this model, are the support of social diversity, the opposition to social exclusion practices and deconstruction of social and cultural barriers on the way toward interaction of all categories of individuals, including individuals with disabilities, into society (Abbott, 2007). In a number of works, e-learning is considered as a means of destroying these barriers to the integration of individuals with disabilities into more active social life (Isaila, 2012). The studies dedicated to e-learning in inclusive education are mainly focused on the assessment of the change in its context, change in the role of the teacher and other factors (Abbott, 2007). The contribution of digital technologies themselves, such as e-learning tools, into the development of inclusive education is considered in a greater degree, characterizing its following needs:

- the use of digital technologies for exercise and repetition;
- the use of digital technologies for helping (assisting) in learning; and
- the use of digital technologies for expanding (enabling) opportunities of learning.

In the third case, digital technologies are given the role of active intrusion into the educative process itself. They, for instance, can facilitate the educational process, actively creating an opportunity to cooperate in its process, thereby contributing to the development of this cooperation. The key difference from the other two categories of digital technologies is that without them such cooperation or other effect will not take place. If we return to the evolution of the web, discussed in the previous section, we will see that the Web 3.0 environment and partly Web 2.0 environment can correspond to the expansion of learning

![Figure 2. The proportion of students with disabilities who study in various countries (data for 2011–2013)](image)

Sources: Ebersold et al. (2011), Fisseler (2012)
opportunities in inclusive education, e.g. through inclusion of VR and augmented reality or social virtual networks.

Let us give consideration to the capabilities of e-learning in higher inclusive education from the perspective of the needs of students with disabilities. The main of these needs are, first, the acquisition of professional and general cultural knowledge and, second, overcoming social and cultural barriers on the way toward active life in the society (O'Donnell, 2016). In order to understand the role of e-learning in the formation of knowledge in individuals with disabilities, let us first consider the general informative structure of knowledge. From the point of view of the form of their manifestation, one can distinguish between explicit (formalized) knowledge and tacit knowledge (Polanyi, 1958) (non-formalized knowledge). Formalized knowledge can be transferred through a formal language. Non-formalized knowledge means personal knowledge that is dependent on the situation and is reluctant to formalization and distribution. The key to acquisition of non-formalized knowledge is personal experience. This knowledge is only transferred from one individual to another. Unlike with transfer of explicit knowledge, transfer of tacit knowledge requires close interaction and buildup of a common understanding and trust between its subjects. Tacit knowledge, in contrast, is personally contextual. It is distributive, and cannot be easily combined. Implementation of its full potential requires close participation and cooperation with the knowledge of the subject. Although it is conceptually possible to distinguish between explicit and tacit knowledge, they are not separate, discrete in practice. Tacit knowledge is the basis for hard skills and soft skills and is crucial for implementation in the profession. In addition, soft skills can be considered as behaviors that help people socialize. Therefore, they are of paramount importance for students with disabilities. Since the mechanism of e-learning is based on formalization, it is fairly efficient for transfer of explicit knowledge. As to transfer of tacit knowledge, e-learning tools can only partly be applied in this area, mainly for the transformation of tacit knowledge into explicit knowledge (Nonaka and Takeuchi, 1995). The receipt of both explicit and tacit knowledge by individuals with disabilities requires assistance in learning and expanding (enabling) its opportunities. Integration into the life of society, overcoming social and cultural barriers by students with disabilities is the main component of higher inclusive education. A certain role can be played by e-learning here. VR, such as E-learning tool 3.0, is both a space transformation technology and a tool for overcoming the existing forms of inequality, including those caused by physical restraints of human capabilities. Its significance is much wider than technology for the entertainment industry. It has apparent significant potential for use as a form of social communication and cultural development of reality (Rosenson, 2013). The integration of e-learning into higher inclusive education from the perspective of key requests of students with disabilities is shown in Figure 3.

Despite the obviousness of the positive effect of e-learning on higher inclusive education, the boundaries of its applicability should be determined as well. In our opinion, the characteristic of e-learning tools in the formation of explicit, tacit knowledge and opportunities of active integration of students with disabilities into the life of society is of interest (Table I).

E-learning tools 1.0, based on Web 1.0, are essentially online training courses with the use of educational shell. These tools are based on formalization and can be used for transfer of explicit knowledge. In this case, students with disabilities should be provided with special software and data support, for example, software for reading as Jaws, ZoomText Fusion, EasyReader, record format for digital talking books – Digital Accessible Information System, etc. Similarly, the use of E-learning tools 2.0 and E-learning tools 3.0 for transfer of tacit knowledge (Table I). E-learning tools 2.0 are more suitable for education of individuals with disabilities than E-learning tools 1.0. This is due to the fact that the key points of E-learning 2.0 consist in the organization of the personal
learning environment. Social networks and blogs which are the foundation of E-learning 2.0 contribute to socialization to a greater extent, but do not always provide the necessary contact with the student. E-learning tools 3.0 (e.g. AR/VR) today most adequately meet the needs of students with disabilities, but still cannot provide complete socialization and transfer of tacit knowledge. VR can become a tool for modeling the external side of a particular social environment, and, accordingly, become a new and powerful way of sharing experiences that will act not through the creation of texts and narratives, but through the formation of a space of experiences. The development of VR technology toward greater immersiveness brings us closer to solving the problem of overcoming the inequality of physical capacities, but still does not solve it. The above confirms the conclusion according to which inclusive education cannot be fully built on the basis of e-learning. Hence, mixed form is the most efficient form as it combines conventional inclusive learning and inclusive e-learning in the universities.

Besides, there are systemic limitations on the use of e-learning in higher inclusive education. Thus, the studies of Martins and Nunes (2016b) have shown that the use of the latest achievements of ICT – e-learning tools – is not always related to improvement of the perception of information by students, and improvement of the quality of their learning. Sometimes the students find an easier way to learn using ICT. The students must be taught to manage information and develop their communication skills. Another issue of e-learning in the higher education is the need to constantly adapt the university environment to a permanent renewal of the e-learning environment (Martins and Nunes, 2016b). Besides, there is a certain problem of trust in e-learning in terms of acquisition of professional knowledge and skills. Overcoming these limitations is facilitated by the formation of a positive institutional environment for the development of e-learning in higher inclusive education and designation of priorities of public policy in this field. In this case, the
limitations and opportunities for e-learning practices in each particular university should be assessed and the institutional arrangements for its adaptation to the existing inclusive education system should be developed.

3.3 Development of e-learning in higher inclusive education: Russian experience

The experience of implementation of e-learning in higher inclusive education in Russia has a relatively short history of development. The interest to the Russian experience is primarily determined by its unique retrospective. On the one hand, the conventional Russian educational system was considered one of the best in the last century, and on the other hand, the mass transition of Russian society to technification began rather late – no earlier than in the late 1990s of the twentieth century. Inclusive education in Russia began to evolve, like in Europe, since the beginning of the 1990s of the twentieth century, which was promoted by the development of Russian legislation in the field of social protection. Despite the fact that the birth of e-learning falls on the same period when the experts in the field of computer technology developed and applied the first software products, it was not adapted to inclusive education and did not become widely used there. Unlike world technologies, the level of computerization in the 1990s of the twentieth century in Russia was so low that e-learning was mainly used for online type of part-time education.

Contemporary institutional environment for the Russian e-learning is formed by general legal and regulatory framework which concerns education in general; in particular, it is the Federal Law on Education in the Russian Federation enacted in 2012. The development of inclusive education is also promoted by the general regulatory legal acts in the field of education and social protection. Special aspects of formation of the institutional environment of inclusive education and e-learning are shown in Figure 4. In spite of the fact that the legal framework of inclusive education and e-learning was formed


Figure 4. Development of foundations of institutional environment of e-learning and inclusive education in the Russian Federation
synchronously, strategic development of the inclusive education in Russia is rather focused on the implementation of other, much more general trends, in particular:

- provision of architectural accessibility in the universities;
- preparation of teachers for work in inclusive groups; and
- organization of accompaniment for the disabled in the universities.

There has been an increase in the number of students with disabilities in recent years in Russia, their proportion in the total number of individuals with disabilities aged 18–30 years old is 8 percent. For comparison, the total proportion of young people aged 18–30 years old who obtain higher education in Russia is 30 percent. Dynamic pattern of admission and total number of students with disabilities in Russian universities is shown in Figure 5. According to the results of the integrated monitoring of the Ministry of Education and Science of the Russian Federation in 2017, Russian universities with high accessibility of education to individuals with disabilities include, in particular, Moscow State University of Humanities and Economics, Moscow State Technical University named after N. Bauman, Dagestan State Medical Academy, Privolzhsky Federal University, Russian University of Economics named after G. Plekhanov, Higher School of Economics and Southern Federal University. The actualization of the development of inclusive education in recent years, caused by the increase in the number of students with disabilities, has identified the problems of its organization and support. Thus, 21 resource centers have been established for the last two years, assigned to 210 universities; a unified information platform has been created – web portal about inclusive education which contains information posted by 902 universities. Within the scope of the development of methodological support for the implementation of higher inclusive education at the level of the Ministry of Education and Science of the Russian Federation, special attention was paid to e-learning. The systemic implementation of inclusive education practices and support of its e-learning are extremely non-uniform in Russian universities. These processes are more actively developed in major universities which are mainly concentrated in the capital as compared to several other regions.

As for the technical aspect of support of e-learning, it has been noted that only 88.7 percent of universities have Broadband Fixed-line Internet and 55.1 percent of Broadband Mobile Internet, which makes it difficult to implement it fully. In general, the share of e-learning online in higher vocational education has reached 1.8 percent in 2016. According to the forecast, its growth will be 4.4 percent by 2021 (Indicators of Education in the

![Figure 5. Dynamic pattern of admission and total number of students with disabilities in Russian universities (according to the Ministry of Education and Science of the Russian Federation)](image)

- The number of newly admitted students with disabilities
- The number of existing students with disabilities
Russian Federation, 2017). Such state of technical aspect of e-learning partly contributes to the fact that E-learning model 2.0, which is mainly based on Web 2.0 technology, where the content is made by the users themselves, dominates in Russian education. The complexity of conversion to the model based on Web 3.0 is evidenced by technological infrastructure of the Russian e-learning (Figure 6). Thus, for example, only 46.2 percent of teachers in the universities use internet in their occupational activity, without which synchronous learning, which forms part of Web 2.0 and, sure enough, is the key element for Web 3.0, is impossible.

In general, the development of e-learning in Russia today by certain estimates lags behind by five to seven years from the world level. It cannot be characterized as systemic; one can identify the main following reasons that hamper its development, in particular:

- weak conceptual construct, the lack of in-depth research on the effectiveness of implementation of e-learning;
- many concepts in regulatory documents contradict one another; and
- there are no common language standards.

Sure enough, the success of education of students with disabilities directly depends on the conditions established by the educational organization of inclusive education. But the mere availability of specialized infrastructure in the university is not enough. Modern educational system should be developed in the higher education programs with special techniques and software, tutorship support and the use of e-learning. It is the development of e-learning that mainly contributes to the implementation of learning requests and integration of students with disabilities into the educational environment in many respects.

At the same time, inclusive education cannot be exclusively based on the e-learning methods. Individual approach to learning, which ensures the acquisition of professional knowledge, skills and competencies, the solution of problems of socialization for students with disabilities and individuals with disabilities can be implemented only under the conditions of a symbiosis of conventional teaching methods, based on direct “student–teacher” interaction and the e-learning. For the purposes of inclusive education, one should use the following undeniable advantages of e-learning:

- ensuring accessibility of learning by means of creation of virtual environment;
- ensuring collaboration of students with disabilities and disabled students with students and teachers through the organization of training groups in electronic space;

![Figure 6. Technological infrastructure of the development of e-learning in Russian universities (data for 2015)](image-url)
• support for students with disabilities and disabled students during learning, and support for teachers in the organization of the e-learning process by creating specialized university structures; and
• consolidation and the most optimal utilization of available university resources and services required for use in e-learning and inclusive learning.

The process of creating conditions for the successful integration of individuals with disabilities into the university environment is very important and responsible, as it requires a comprehensive solution of a wide range of problems both at the level of universities and at the level of country and regions in general.

Nevertheless, the main problems of the provision of inclusive education with e-learning cannot be solved by means of administrative measures and regulations (Babintsev et al., 2016). The main issues here are not the choice of the form of e-learning, but the goal of innovations in education – e-learning – and their benefits for students with disabilities and society in general. The answers to these questions depend on the prevailing ideas about the functional role of higher education in the society.

4. Conclusion
This study allowed us to examine e-learning from the perspective of the evolution of the web environment which constitutes its technical basis. On the other hand, the needs of society in ensuring accessibility of education, including higher education, to individuals with disabilities, put forward new demands for the development and adaptation of e-learning. The advantages and disadvantages of e-learning are primarily determined by the ability to transfer various forms of knowledge and opportunities for collaboration for students with disabilities with teachers and other students, which creates certain conditions for their socialization. In this regard, conclusion can be made according to which e-learning for inclusive education can be fairly efficient, but mainly in combination with conventional learning. The study of the Russian experience of the development of e-learning and inclusive has shown the need for systemic institutional environment that is created for their further development and synthesis.

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