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# **Possibilities and methods of using distance learning applications in school practice**

## **Możliwości i metody wykorzystywania aplikacji wspomagających kształcenie na odległość w praktyce szkolnej**

### **Abstract**

The article presents the possibilities and methods of using applications supporting distance learning. The issues focus on the main others in addition to ICT in the field of didactics of early childhood and preschool education. Part one is a market overview of the children's ICT development market. Based on parts of the study, solutions were developed which, in the opinion of experts (taking into account age and developmental possibilities), can mostly be used in the first educational age. The last of the main parts of the article, conclusions and recommendations for teachers in the field of comprehensive use of ICT in the educational process.

**Key words:** ICT, e-learning, education, school, remote education.

### **Streszczenie**

W artykule przedstawione zostały możliwości i metody wykorzystania aplikacji wspomagających kształcenie na odległość. Zagadnienia koncentrują się na głównych zastosowaniach technologii informacyjno-komunikacyjnej w zakresie edukacji przedszkolnej i wczesnoszkolnej. Część pierwsza to ogólny przegląd rynku rozwoju TIK dla dzieci. Na podstawie fragmentów badań opracowano rozwiązania, które zdaniem autorów (biorąc pod uwagę wiek i możliwości rozwojowe) mogą być w większości stosowane w pierwszym wieku edukacyjnym. Ostatnia z głównych części artykułu przedstawia wnioski i rekomendacje dla nauczycieli w zakresie wielostronnego wykorzystania TIK w procesie edukacyjnym.

**Słowa kluczowe:** ICT, e-learning, edukacja, szkoła, edukacja zdalna.

### **Introduction**

The world in the era of the information society is undergoing huge changes. Rapid development can be observed both in social and economic aspects. The enormous pace of change we are currently experiencing translates directly into

the development of every area of life. Modern man is obliged to think in new categories, thus setting life goals and aspirations that fit into the current time. The observed phenomenon forces institutions directly responsible for education to take the right place.

Among the proposed solutions for adapting academic education to the requirements of modern times, there is the dissemination of innovative forms of education at universities that use e-learning technologies. The contemporary image of education with a high degree of certainty points to significant gaps in this area, which additionally directs the search for supplementary forms of education<sup>1</sup>.

The use of e-learning as a form of education in didactics is closely related to the need to define the role of the teacher in a completely new reality. Currently, his task is no longer to transfer ready knowledge, but to guide the student in acquiring it on his own. The teacher ceases to be at the center of the educational process and is to fulfill a new role – that of a consultant or mentor. In addition, these activities are understood as a continuous process, which is of key importance in the context of conducting classes through e-learning technologies. The teacher brings the baggage of his own experience, which he should translate to the new didactic situation in the best possible way. It should present reality from many perspectives and use problem and operational strategies for this purpose.

### **E-education platforms – analysis of the phenomenon**

Currently, e-learning platforms, which are the leading e-learning technology, are used to a greater or lesser extent at every school and university in Poland. In the education environment, they can both act as a repository of teaching materials and be a specific communication medium between the teacher and students. Each platform has a number of features, among which the following should be distinguished: creating educational content, comprehensive management of the education process, analyzing the educational progress of users or integration with other information systems<sup>2</sup>.

Currently, there are many e-learning platforms available on the market used in the higher education environment, which are divided into three main groups:

- paid (commercial) – offered by companies that create and sell e-learning systems (an example may be *WBTServer* offered by 4System and *Teams* by Microsoft),

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<sup>1</sup> T. Warchoń, *Wsparcie edukacji formalnej z wykorzystaniem edukacji pozaformalnej – warsztaty interaktywne*, „Edukacja. Technika. Informatyka” 2017, nr 2(20), p. 46.

<sup>2</sup> P. Kopiał, *Analiza metod e-learningowych stosowanych w kształceniu osób dorosłych*, „Zeszyty Naukowe Warszawskiej Wyższej Szkoły Informatyki” 2013, nr 9, pp. 79–99.

- free (*open source*) – using the GNU license and being software packages for creating your own courses with the possibility of copying, sharing and modifying sources<sup>3</sup>,
- created individually – these are usually dedicated solutions that include ready-made e-learning courses (to be used for specific tasks)<sup>4</sup>.

The first of these groups are commercial platforms, the use of which must be paid, and their source code is not made publicly available. A characteristic feature of these platforms is technical support from manufacturers and the ability to efficiently modify the functionality of the platform depending on the customer's needs. In the case of universities, the most commonly used platforms are: *Fronter*, *WBTServer*, *BlackBoard* and *Microsoft Teams*.

The second group is the so-called *open source* platforms that are free and their source code is freely available. In the first phase of their creation, they were used only to get acquainted with the functionality of professional platforms, and nowadays their optionality is comparable to them. Among the most popular in the academic environment, the following should be distinguished: *Dokeos*, *eFront* and *Moodle*.

The third group of e-learning platforms are those that are dedicated to a specific university. They are used to carry out distance learning through them<sup>5</sup>. Among the tools implemented for the needs of specific universities, the following should be distinguished: Center for Teaching Mathematics and Distance Learning (Gdańsk University of Technology), Study Administration System (Warsaw University of Technology), EDU (Polish-Japanese University of Information Technology in Warsaw).

Each of the e-learning technologies, regardless of the type, is built of specific modules whose synergy creates a fully functioning IT system.

By analyzing contemporary e-learning platforms used in the school environment, it is possible to assess the most important benefits resulting from their use.

One of the key components of these tools is, according to the constructivist theory, the possibility of creative self-expression by performing tasks in interactive programs that enable both individual and group work of students. A characteristic element of modern platforms is the implementation of a large number of exercises and projects as well as a built-in educational progress control system, through which both the teacher and students can constantly control the didactic results.

A noteworthy convenience is the on-line scheduler, through which you can effectively plan and organize students' working time, both during the implementation of individual and group projects. In terms of teacher-student contact, modern e-learning platforms enable asynchronous (e-mail, forum) and synchronous (chat)

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<sup>3</sup> W. Prządka, *Analiza porównawcza narzędzi e-learningu*, „Journal of Computer Sciences Institute” 2017, nr 3, p. 64–69.

<sup>4</sup> Z. Zieliński, *E-learning w edukacji*, Gliwice 2002, p. 20.

<sup>5</sup> W. Prządka, *Analiza porównawcza...*, pp. 64–69.

communication. An undeniable convenience resulting from the use of e-learning technologies is also a significant cost reduction. The implemented form of education eliminates the entire range of expenses related to travel, renting rooms and accommodation<sup>6</sup>.

An equally important feature is the ability to easily modify outdated training content in the e-learning course<sup>7</sup>.

The development of e-learning systems has also led to the development of the so-called virtual laboratories through which students can carry out simulations of experiments that they could not afford in real conditions. This makes it possible, according to the cognitive theory of many channels, to illustrate the phenomena discussed in the classes in an accessible and much friendlier way compared to traditional forms of education.

The usefulness of e-learning platforms can be summed up in the words of S. Juszczyk, who believes that they eliminate class and lesson, time and space limitations and play an invaluable role in the acquisition of knowledge and skills in the school and academic environment<sup>8</sup>.

### Technologies for early and pre-school education

The traditional school, based on oral and written transmission of messages, is slowly becoming a thing of the past. In order to meet the expectations of parents and, above all, to interest and interest students, teachers should use methods adequate to the changing reality in their work<sup>9</sup>. Children, accustomed to screens and access to the Internet from an early age, could find it difficult to find their way in a school based only on learning with a primer, pencil and notebook. A much more accessible way of acquiring knowledge would be to use modern technologies for this purpose, hence a big challenge for teachers<sup>10</sup>. In order to perform their role well, and thus effectively teach their pupils, teachers should become familiar with the advantages of modern technologies, learn about the possibilities they offer and use them in their work<sup>11</sup>. Teachers of early and pre-school education face a particularly

<sup>6</sup> M. Grabania-Mukerji, *E-learning w edukacji*, „Zeszyty Glottodydaktyczne” 2011, nr 3, pp. 3–4.

<sup>7</sup> K. Tuczyński, *Criteria for Evaluating the Quality of e-Learning Courses in Higher Education*, „Edukacja. Technika. Informatyka” 2017, nr 4(22), pp. 341–346.

<sup>8</sup> S. Juszczyk, *Edukacja na odległość – kodyfikacja pojęć, reguł i procesów*, Toruń 2002, p. 202.

<sup>9</sup> I. Rakhimovich, J. Ibrokhimovich, *The Use of Information Technology in Primary Schools*, „Texas Journal of Multidisciplinary Studies” 2021, vol. 2, p. 7.

<sup>10</sup> S. Koster, E. Kuipert, M. Volmant, *Concept-guided development of ICT use in ‘traditional’ and ‘innovative’ primary schools: what types of ICT use do schools develop?*, „Journal of Computer Assisted Learning” 2012, vol. 28, p. 454.

<sup>11</sup> Ç. Uluyol, S. Şahin, *Elementary school teachers’ ICT use in the classroom and their motivators for using ICT*, „British Journal of Educational Technology” 2016, vol. 47, p. 65.

difficult task, because in addition to the use of modern technologies in learning to read and write, they should sensitize the youngest from the very beginning to the dangers lurking on the Internet and teach them to use Internet sources reasonably<sup>12</sup>. However, this does not change the fact that technologies can be very useful and even necessary in early and pre-school education.

Great emphasis in current education is placed on self-education. For this purpose, information technologies are extremely useful. As Krystyna Łangowska-Marcinowska writes: “The use of a virtual platform in teaching makes it possible to transform the traditional model of teaching, in which the teacher imparts knowledge, into a model of supervised self-education. The teacher on the virtual platform acts as the organizer of the teaching process. It creates conditions in which the student learns on his own”<sup>13</sup>. This is also confirmed by the results of the Report by Przemysław Czapliński, which Katarzyna Pluta refers to when she writes: “Students from the beginning of education should be accustomed to actively acquiring knowledge, skills, independent and creative action and constructive use of information and communication technologies for learning purposes”<sup>14</sup>.

Apart from the implementation for self-education, ICT has many other advantages. They include e.g.:

- Strengthening the function of education;
- Arousing interest in the presentation of content;
- Flexibility of forms of transmission and communication;
- Enabling the adaptation of learning content to the level of students;
- Supporting the learning process;
- Learning by playing;
- Meeting students’ expectations and needs;
- Worldwide ease of use.

A teacher who wants a student to get the aforementioned benefits from learning should know the areas in which the student moves online. It would also be valuable for him to know the roles that children can play on the Internet. A young person can be a recipient of content, a participant (when he contacts other people online) and an actor (when he undertakes activities on his own with the use of the Internet<sup>15</sup>. The last of the roles allows for “creative self-expression by independently producing,

<sup>12</sup> F. Pineida, *Competencies for the 21st Century: Integrating ICT to Life, School and Economical Development*, „Procedia – Social and Behavioral Sciences” 2011, vol. 28, p. 56.

<sup>13</sup> K. Łangowska-Marcinowska, *Nauczanie zdalne (e-learning) cechą nowoczesnych technologii w edukacji*, „Pedagogika Przeszkolna i Wczesnoszkolna” 2020, vol. 8, p. 64.

<sup>14</sup> K. Pluta, *TIK w edukacji wczesnoszkolnej, czyli rola i możliwości wykorzystania wybranych narzędzi cyfrowych w uczeniu się dzieci klas młodszych*, „Kwartalnik Edukacyjny” 2021, nr 104–105, p. 36.

<sup>15</sup> A. Iwanicka, *Od biernego odbiorcy do aktywnego mediakratora – małe dzieci i TIK w świetle badań własnych*, „Interdyscyplinarne Konteksty Pedagogiki Specjalnej” 2018, nr 23, p. 152.

producing and finally publishing media content”<sup>16</sup>. Undertaking this type of activity on the Internet allows the student to express himself, share his passions, interests and opinions with others. Therefore, this role brings many benefits, unfortunately, as the author of the article points out, it is not popular among children of early school age. This could change thanks to teachers who would show their students at school how to create desirable, valuable content using ICT tools. This has a double advantage. In addition to learning how to use ICT tools, students could perform tasks aimed at consolidating the knowledge, repeating the already learned material or extending the existing scope of knowledge.

However, the teacher in his work should not forget that ICT carries many risks in various spheres of student development. ICT can pose risks to physical health as well as cognitive, emotional and social development<sup>17</sup>. The risks associated with the first of these areas are postural defects, vision defects, obesity and traumatic syndrome (carpal tunnel syndrome). The cognitive development of a student using ICT may be disturbed due to the inability to distinguish between real and virtual reality. This is due to the fact that the cerebral cortex of preschool children is not yet fully developed. In terms of emotional and social development, “the use of ICT in situations where it is excessively excessive can disrupt the pool of time devoted to social interactions”<sup>18</sup>.

In order for the use of information technology in teaching to be beneficial, teachers are needed properly prepared for it. They should be familiar with the wide possibilities of ICT tools<sup>19</sup>. It would be valuable to equip teachers with IT competences already during their preparation for the profession, so that from the very beginning of their professional career they would be able to efficiently navigate the Internet paths<sup>20</sup>. Unfortunately, both current and future teachers have significant gaps in the knowledge of ICT, as evidenced by the research of Urszula Ordon and Katarzyna Serwatko. According to them, only 20% of the respondents (early school and pre-school education teachers) assessed their own competences as very good<sup>21</sup>.

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<sup>16</sup> Tamże, p. 156.

<sup>17</sup> J. Pyżalski, M. Klichowski, M. Przybyła, *Szanse i zagrożenia w obszarze wykorzystania technologii informacyjno-komunikacyjnych (TIK) ze szczególnym uwzględnieniem aplikacji mobilnych (TIK-mobApp) przez dzieci w wieku 3–6 lat*, Poznań 2014, p. 66.

<sup>18</sup> Tamże, p. 71.

<sup>19</sup> G. Wambiri, M. Ndani, *Kenya primary school teachers' preparation in ICT teaching: teacher beliefs, attitudes, self-efficacy, computer competence and age*, „African Journal of Teacher Education” 2016, vol. 5, p. 3.

<sup>20</sup> H. Baharudin, A. Masnana, A. Zain, *The developments and challenges of the integration of interactive whiteboard technology in teaching and learning reading skills for preschool children*, „Journal Pendidikan Awal Kanak-Kanak Kebangsaan” 2020, vol. 9, p. 50.

<sup>21</sup> U. Ordon, K. Serwatko, *Kompetencje informatyczne w samoocenie nauczycieli edukacji przedszkolnej i wczesnoszkolnej*, „Edukacja. Technika. Informatyka” 2016, nr 3, p. 155.

## Recommendations regarding the implementation of classes using ICT

To conduct classes with the use of ICT, one should be adequately and methodically prepared<sup>22</sup>. First of all, you need to provide all students with technical resources and make sure that each student has access to the appropriate hardware and software that will be needed during classes.

Another aspect is the selection of appropriate tools that enable the achievement of didactic goals, as well as the preparation of a lesson plan with their use<sup>23</sup>. The teacher should think carefully about what content will be discussed, how it will be delivered and what tasks the participants will have to perform.

The teacher must also remember about interaction and encourage students to actively participate in classes, to express themselves, and to do exercises. The teacher should also be flexible in his work and prepared for technical problems that may arise during work<sup>24</sup>. Learning with the use of ICT can also be time-consuming – the pace of teaching should be adapted to the abilities and needs of students.

The teacher must also not forget to take care of safety. It is very important that he familiarizes children with the principles of proper use of the Internet and sensitizes them to the protection of personal data<sup>25</sup>.

After the end of the classes, evaluation is recommended – students' assessment of the past lesson will allow us to draw conclusions for the future, so that each subsequent meeting with the use of ICT will be more valuable.

As already mentioned, the teacher should know the tools that can be useful to him in working with ICT. Belong to them:

- Tablets and smartphones – these devices are increasingly popular with children and can be used as an educational tool. There are various apps and games that help you learn reading, writing, math and other subjects<sup>26</sup>.
- Interactive boards – are large touch screens that allow for interactive learning. The teacher can use the interactive whiteboard to show videos, presentations, quizzes and educational games<sup>27</sup>.

<sup>22</sup> J. Tondeur, R. Scherer, E. Baran, F. Sissiq, T. Valtonen, E. Sointu, *Teacher educators as gatekeepers: Preparing the next generation of teachers for technology integration in education*, „British Journal of Educational Technology” 2019, vol. 50, p. 1190.

<sup>23</sup> V. Dagdilelis, *Preparing Teachers for the Use of Digital Technologies in Their Teaching Practice*, „Research in Social Sciences and Technology (RESSAT)” 2018, vol. 3, p. 109.

<sup>24</sup> H. Salehi, Z. Salehi, *Challenges for Using ICT in Education: Teachers' Insights*, „International Journal of e-Education, e-Business, e-Management and e-Learning” 2012, vol. 2, p. 40.

<sup>25</sup> A. Katz, *Making Your Primary School E-safe: Whole School Cyberbullying and E-safety Strategies for Meeting Ofsted Requirements*, Great Britain 2015, p. 7.

<sup>26</sup> D. Batorski, *Dzieci z sieci – dostęp i korzystanie z internetu przez dzieci w wieku przedszkolnym [w:] Małe dzieci w świecie technologii informacyjno-komunikacyjnych – pomiędzy utopijnymi szansami a przesadzonymi zagrożeniami*, red. J. Pyżalski, Łódź 2017, p. 91.

<sup>27</sup> B. Jakubczak, *Projektowanie zajęć dydaktycznych z wykorzystaniem tablicy interaktywnej SMART board*, Kalisz–Konin 2013, p. 294.

- Computers – Computers are increasingly common in schools, even in kindergarten classrooms. Children can use educational programs, games and applications that help them learn.
- Educational robotics – is a technology that allows you to learn how to program and build robots. Children can use sets of programmable blocks that allow you to create simple robots and program their operation<sup>28</sup>.
- Internet – The Internet is an unlimited source of information and educational materials. Teachers can use the Internet to search for additional educational materials and children can use the Internet to find information on various topics.
- E-books and audiobooks – Electronic books and audio recordings are increasingly popular with children. They can help you learn to read and listen, as well as enrich your knowledge of a variety of topics<sup>29</sup>.

A classroom equipped with these tools should motivate the teacher to conduct classes with the use of ICT. However, this is only possible if he knows the right websites and applications adapted to the age and abilities of students. There are plenty of website proposals on the web, but you should make a selection and choose the most effective and interesting ones. It is worth including:

- Soroban – an online abacus helpful in learning to count;
- Magdalenki games – a program for learning mathematics and spelling;
- HEXelon – multiplication table;
- Boomwriter – a program helpful in learning to read and write – the task of students is to add a continuation of the story they have started;
- English for children – 7 diamonds – children, wandering around a mysterious city, learn English;
- Colors 1.0 – a collection of coloring books for children<sup>30</sup>;
- Kahoot/Quizizz – programs for creating quizzes, surveys, riddles, competitions, can be used as a tool to test knowledge;
- LearningApps.com – a collection of templates from which the teacher can create interactive exercises for students to perform using an interactive whiteboard;
- Padlet-teacher can put information for parents of children in this program, as well as pdf files, video materials and create collections of materials<sup>31</sup>.

Undoubtedly, modern technologies are very attractive, both for children and teachers. Their visual and sound setting, however, cannot become a criterion determining the use of given tools. Teaching using only ICT can be dangerous for the learning process. “Graphics and sound in computer programs, as well as movement

<sup>28</sup> B. Kuźmińska-Solśnia, K. Ziębakowska-Cecot, *Przygotowanie przyszłych nauczycieli do wdrażania nauki programowania w edukacji elementarnej*, „Edukacja. Technika. Informatyka” 2017, nr 3, p. 149.

<sup>29</sup> T.W. Cavanaugh, *eBooks for Elementary School*, United States 2014, p. 4.

<sup>30</sup> M. Ostrowska, D. Sterna, *Technologie informacyjno-komunikacyjne na lekcjach. Przykładowe konspekty i polecane praktyki*, Warszawa 2015, pp. 54–55.

<sup>31</sup> M. Śniadkowski, *Wyniki badań interdyscyplinarnych w aspekcie edukacji techniczno-informatycznej i bezpieczeństwa*, Lublin 2020, p. 30.



and action on the monitor screen, attract attention and are interesting for students, but they will be of no use if the selected ICT tools do not have the appropriate substantive value and students are not able to efficiently make use of them”<sup>32</sup>.

A teacher using ICT at work should be accompanied by the statement “If we want students to become smarter than smartphones, we need to carefully rethink the pedagogies we use in teaching. Technology can enhance very good teaching, but even very good technology cannot replace poor teaching”<sup>33</sup>. It is therefore worth remembering that technology cannot replace direct interaction between the teacher and the student and cannot be the only source of learning. Technology should be treated as a tool supporting the learning process, not its substitute.

## Conclusion

The development of the information society requires innovative forms of information transfer from modern education. The ossified form of education, focused mainly on providing ready-made knowledge, should be enriched with various ICT technologies, which for students are the natural environment for their functioning in society. It is important that the e-learning technologies used are not limited to supporting traditional education with modern teaching aids (such as an interactive whiteboard, visualizer or didactic software), but that they constitute the form of didactic classes.

However, the use of e-learning technologies in the school environment requires teachers to find themselves in a new didactic situation. The task of the teachers is to use their own experience and relate it in the best possible way to the remote form of education.

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<sup>32</sup> M. Ostrowska, D. Sterna, *Technologie informacyjno-komunikacyjne...*, p. 127.

<sup>33</sup> *Students, Computers and Learning: Making the Connection*, <http://dx.doi.org/10.1787/9789264239555-en> (dostęp: 25.04.2023).

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