



REPORT ON POSSIBLE SYNERGIES BETWEEN INFORMATION AND COMMUNICATION TECHNOLOGIES AND ADULT EDUCATION IN POLAND

Material developed by
The „CRAS” Association – Centre for the Development of Social Activity
as part of the project titled:
„INTRA – Innovative Technologies of Responsible Automation”
under the Erasmus + Programme,
Agreement Number 2022-1-IT02-KA220-ADU-000085744





Introduction

“The Internet has changed the world, and the world is changing the Internet. Education must not be a latecomer on the web.”¹ This quote, from a Polish educator, professor of humanities and chairman of the Pedagogical Sciences Committee of the Polish Academy of Sciences, Bogusław Śliwerski, best describes the reality around us. Over several decades, the Internet (the beginnings of the development of the web date back to the 1960s) has revolutionised all aspects of life – from technological processes and communication, to interpersonal relationships. Today, we can no longer imagine life without access to the web and the use of electronic devices and related information and communication technologies. The digital revolution has transformed education, both in terms of ways of acquiring and using knowledge, and in terms of educational tools. First of all, it changed the way we see education. Nowadays, the education process is not limited in time and does not end with the attainment of a specific profession, academic degree or qualification. The ubiquitous digital reality and its continuous development has forced a change in the approach to the subject of learning. Today, teaching must take into account the digital reality, respond to its needs and use new tools and technologies. In this way, education builds its competitiveness and attractiveness for the recipient. Nowadays, education never ends. It is a lifelong process, independent of the age of the learners. This is why adult education has taken on a completely different dimension.

This paper attempts to examine the most important relationships between the sphere of adult education and the development of information and communication technologies.

The influence of Information and Communication Technologies in adult education

Changes in the Polish approach to adult education resulting from the development of information and communication technologies and the dissemination of digitalisation were noticed and articulated already more than a decade ago. In the brochure of the Centre for Education Development, published in 2011, the author of an article entitled "New trends in adult education", notes that: in the age of ubiquitous modern information and communication technologies (ICT), they should not be lacking in the adult education process. Modern adult education is moving away from didactic encyclopedism in favour of combining traditional lecture methods with the use of ICT, and with active methods of group work, workshops, training or the moderation method. Modern adult education is one in which the educator does not have "one right" role and the only effective method of education. Instead, as a coach, facilitator or moderator, they use the personal interests, experience and intrinsic motivation of adults to learn. By creating a positive and supportive learning environment, they motivate the adult student to independently acquire knowledge, inspire and strengthen the learning processes. Thanks to such actions by the educator, the learner independently

¹ A. Andrzejewska „Wyzwania i zagrożenia przestrzeni cyfrowej dla edukacji i aktywności zawodowej” w: „Kompetencje przyszłości” pod red. S. Kwiatkowskiego, Wydawnictwo FRSE, Warszawa 2018, s. 378. [“Challenges and threats of the digital space for education and professional activity” in: “Competences of the future” ed. S. Kwiatkowski, FRSE Publishing House, Warsaw 2018, p. 378]



manages the process of learning and development, strengthens their sense of self-agency and thus also of self-worth.”²

In the cited quotation, special attention is paid to the fragment concerning the role of the teacher, which has been completely transformed by the emergence of the digital world in education. The author of the above-mentioned words does not focus solely on the digital revolution itself, but on how this revolution has affected the person of the educator. The presence of digital technologies and the fact that they remove barriers to access to information, time and space has completely transformed the nature of a teacher’s work. In relation to the student, in this case an adult, the teacher no longer stands in the *ex cathedra* position, from which they transfer their knowledge and skills and then test the level of assimilation. As rightly observed, the digitalisation of education has made the educator move to the role of a learner’s companion, guide and mentor, indicating possible and available directions of development, opportunities and sources of acquiring knowledge. The acquisition of knowledge is left to the discretion of the student who has the motivation for it. Even more interesting, the teaching process itself has also changed. The flow of information is no longer one-way, only *from teacher to student*. There is now a process of bilateral exchange of knowledge and experience. Including from *student to teacher*. This is due to the huge, almost unlimited, access to knowledge and information, the amount of which is beyond the reach of one person, even an outstanding specialist in a given field. Therefore, the process of teaching adults in the digital reality takes place bilaterally, and the role of the teacher is also to skilfully use the knowledge and experiences of the student in the process of their education and indicate the benefits and possibilities of using them. Thus, the focus of the adult education process shifts to the adult person, by activating and working independently, and not only by acquiring the given knowledge, as used to be the case.

The development of ICT tools and the progressive digitalisation of all areas of life have created a new trend in adult education. Today, informal education is very popular. In this form of education, knowledge and competences are acquired without the use of programs offered by various educational and training entities, and thus without the participation of a teacher or trainer. The form of this education is also incidental education, implemented in an unplanned way, where the acquisition of competences takes place *incidentally*, for example, while doing other things for which these skills are needed.

In this way, adult learning is completely detached from the teacher and is based on ICT. It is the development of modern technologies that popularised this type of opportunities and forms of education. The methods of acquiring knowledge via the Internet and modern technologies based on IT include popular social networking sites such as Facebook, YouTube and Twitter, as well as various educational platforms, vortals, specialised discussion forums or by running or regularly reading author's blogs³. Over recent years, the range of educational opportunities and tools being used have significantly expanded. Webinars, live, podcasts, on-line courses, educational applications and tutorials, as well as instant messengers enabling direct meetings have gained popularity, for example, Zoom, Google Meet, Teams, etc. and related collaborative tools (e.g. Jamboard in the Google space).

² Mikołajczyk K. „Nowe trendy w kształceniu dorosłych”, Broszura Ośrodka Rozwoju Edukacji, Warszawa 2011, s. 2. [“New trends in adult education”, Brochure of the Centre for Education Development, Warsaw 2011, p. 2.]

³ Ibid., p. 10.



Digital expansion in the field of adult education led to the emergence of modern forms of education, such as e-learning (based on the use of information technology), m-learning (based on the use of mobile technologies in the educational process) and blended learning. This last form of education turns out to be one of the most effective solutions. Blended learning involves combining traditional teaching with the use of modern technologies in the process of education. The most common form of blended learning training is the combination of traditional classes with on-line classes. The blended process makes use of both traditional teaching tools and methods as well as new ones, mainly related to e-learning, in order to achieve the highest possible effectiveness. Thanks to this, the strengths of electronic training (i.e.: time and resource saving, the possibility of the participant learning anywhere and any time) are combined with direct contact with the trainer or workshop group and creates the opportunity to practice issues in direct contact⁴.

Subsequent years of the 21st century are bringing further dynamic digital development and an increase in the level of social accessibility to information and communication technologies. This is manifested, among others, in the universal and often free access to tools for: information processing, quantitative and qualitative analysis, image processing, text editing. In turn, unlimited access to tools and information leads to individualisation of the form and content of this access. In the modern, digitalised world, an adult has almost unlimited learning opportunities using multimedia educational resources from around the world. They can educate themselves anywhere and any time, using those modern technologies that best suit their needs and enable them to acquire the new skills they need at the moment⁵.

Nowadays, in the field of education at every level, there is a phenomenon of a peculiar paradox, i.e. we are dealing with an unlimited amount of resources and sources of knowledge, with the limited cognitive capabilities of a person. That is why digital devices and technologies are no longer just serving and being used by people, they have become their companions, a supportive resource, and tools to transcend the boundaries of human cognition and memory. So-called *intelligent solutions*, consisting, among others, of the cooperation of systems and devices, communicating with each other and operating on the basis of algorithms, are becoming increasingly popular. This trend is also evident in adult education. Intelligent e-learning systems are increasingly being used, i.e. systems developed using tools that allow didactic content to be adapted in an automated way, taking into account both the learning path planned by the teacher and the actual learning progress of the learner. This is by no means the end of the development of this direction. The next step may be a complete transformation toward the use of augmented reality in education (i.e. a system connecting the real world with a computer generated one). For now, such elements are being introduced in the education programs of some universities. However, according to experts, the use of virtual and augmented reality in adult education has wide-ranging prospects. Examples of such solutions include, among others, prototyping by creating simulators of machines, devices or entire

⁴ Ibid., p. 10.

⁵ Mikołajczyk K., „Rola Internetu w upowszechnianiu edukacji dorosłych”, w: „Przestrzenie i miejsca edukacji dorosłych w Polsce”, pod red. M. Gromadzkiej, Wydawnictwo Fundacji Rozwoju Systemu Edukacji, Warszawa 2018, s. 118. [“The role of the Internet in promoting adult education”, in: “Spaces and places of adult education in Poland”, ed. M. Gromadzka, Publishing House of the Foundation for the Development of the Education System, Warsaw 2018, p. 118.]



technological lines, which is significantly cheaper using the aforementioned augmented reality technology than doing it only in real conditions. The use of such techniques allows more effective practising of skills and procedures. Trainers see the possibility of using virtual reality to create a friendly environment for teamwork exercises, simulating events or crisis procedures. In turn, for the health sector, it is predicted that the development of augmented reality will serve to improve life-saving procedures⁶.

The educational opportunities of adults are extended by the offer of free educational services, in the form of e.g. on-line courses. Examples of Polish solutions include⁷:

- on-line courses prepared by Polish scholars, made available by Copernicus College, for anyone interested,
- a library of about 94 free e-learning courses, including those developed for mobile devices, about business topics, made available by the Polish Agency for Enterprise Development, intended mainly for entrepreneurs from the SME sector,
- an e-learning educational project for adults, called the NFZ Academy, addressed to all people who are close to the topic of health care. In addition to e-learning training concerning, among others, preventative healthcare, the rights and obligations of patients, the portal also provides videos, mobile applications, games and quizzes,
- Electronic Platform for Adult Learning in Europe – EPALE. Its task is to integrate the environment related to adult education. The platform regularly publishes various studies on adult education, as well as a blog devoted to the latest trends in this sector. In Poland, the activities carried out within the platform are coordinated by the Foundation for the Development of the Education System.

In addition to large educational initiatives, such as those mentioned above, on the education market there is currently a *flood* of various types of courses, tutorials, educational applications, as well as hybrid solutions, e.g. combining the physical form of a textbook/journal with an application or access to multimedia files supporting learning.

The future of adult education in the world of information and communication technologies

The future of adult education in the digital world will be determined by further inventions and innovations. In 2018, less than 5 years ago, the occurrence of the following trends in adult education was predicted⁸:

- dynamic development of automation, related both to the process of creating content, as well as the course of e-learning courses or on-line lectures. Automation in education means, among others, automatic creation of knowledge tests assigned to specific content, the use of algorithms in assessing the activity of users of a given course or the selection of content according to the preferences of a given user,

⁶ Ibid., p. 119.

⁷ Ibid., p. 120.

⁸ Ibid., p. 122-123.



- dynamic development of the use of mobile technologies in e-learning, thanks to which an adult student will have unlimited possibilities in every place with access to the Internet through the use of their phone. Thanks to this, they will be able to educate themselves at any time available to them (e.g. at home, while travelling, commuting from work, during a trip, etc.),
- learning with the use of augmented reality, which will soon increasingly enter into various aspects of life, including the process of adult education, e.g. through the use of virtual reality glasses, during simulation training games of various kinds, etc.,
- cloud solutions, i.e. access to e-learning courses/educational applications in the form of a comprehensive service, as well as in the scope related to the development of tools for analysing enormous amounts of data: so-called Big Data,
- gamification, consisting in the use of mechanisms known from games during the educational process. This is aimed at motivating the on-line course participant to act and increase their engagement or simply to make boring, repetitive and monotonous activities more enjoyable. Thanks to gamification, the participant of on-line classes voluntarily undertakes tasks for which they usually find it difficult to motivate themselves.

Forecasts from 5 years ago turned out to be inadequate to describe the upcoming changes. The catalyst that significantly accelerated the use of information and communication technologies in all areas of life, and especially in education, was the outbreak of the COVID-19 pandemic. Out of necessity, i.e. due to the introduction of practically worldwide restrictions on people-to-people contacts (e.g. restrictions on meetings, travel, work, classes in schools and universities etc.), it was necessary to transfer all possible spheres of life to the web. For this reason, the on-line education sector, both formal and informal, has developed dynamically. The dynamics of the situation meant that even people who had not used the web very actively for professional or educational purposes were forced to change their habits and behaviours. Direct contact tools, such as Zoom, Teams and Google Meet, gained popularity, which allowed classes to be conducted in real time. Educational materials were created in the form of podcasts, YouTube videos, webinars, interactive presentations, etc., which users could access at any time. The pandemic significantly accelerated the digital revolution in education. Solutions developed during its duration have become a fixture in the range of training and educational being offered. Existing training and educational institutions, in order to meet the expectations of clients, now offer training, courses, studies or postgraduate studies in hybrid form or with alternative options, i.e. either in an in-person form or in on-line form (data on the basis of university offers and the Development Services Database). The possibility of hybrid or remote education has contributed to increasing the availability of the offer for a wider range of people, who thus have greater opportunities to combine professional and private life with education and save time.

The changes caused by the COVID-19 pandemic have quickly become the subject of socio-economic analyses. The most important of them include⁹:

⁹ Bleszyńska K., M., Orłowska M., „COVID-19 jako katalizator zmian w edukacji dorosłych”, w: „Wyzwania edukacyjne czasu pandemii COVID-19”, *Pedagogika Społeczna* nr 3-4 (81-82), Rok 2021, s. 31-32. [“COVID-19 as a catalyst for changes in adult education”, in: “Educational challenges of the COVID-19 pandemic”, *Social Pedagogy* No. 3-4 (81-82), 2021, p. 31-32.]



- increasing the degree of use and making real the possibility of transferring into the virtual space services previously assigned to specific physical spaces, such as banking, administration, health care and, above all, education;
- changes in the way work is organised in the area of many professions, expressing a departure from the paradigm of work performed in a specific place and time under the supervision of management for the implementation of specific tasks or permanent work performed in a teleworking system or remote work; the change in question, on the one hand, allows for the implementation of the principle of flexibility of employment proposed by the International Labour Organisation, which is beneficial for many groups of workers (especially those caring for dependent family members), and on the other hand, it allows employers to save money resulting from transferring to the employee at least part of the cost of maintaining their workplace (costs of electricity, water, equipment, cleaning, etc.);
- **a change in the perception of part-time education, which has so far been situated (at least in Poland) in the areas of didactic experiments or niche forms of supplementing traditional forms of education, and changes in the relationships between the teacher and the learners in the disposal of educational resources;**
- the proliferation, enforced by circumstances, of the latest information technologies (such as the use of interactive tools offered by Zoom, MS Teams or ClickMeeting platforms) and the digital competences associated with them;
- increased use of social networks and streaming platforms;
- accelerated digitalisation and access to scientific and cultural resources (such as review materials, instructions, library and museum collections, exhibitions, concerts, theatre and opera performances) under various conditions;
- the resulting change in the position of persons caring for and providing scientific and cultural resources, consisting in the transition from the tasks of a guardian or custodian of these resources to the role of an active co-creator or designer of a given event and a guide and advisor in searches undertaken;
- **activation and increase of the independence of adult learners and a shift of the student – teacher relationship toward tutoring.**

All of these changes are related to technological progress and the digitalisation of spheres of economic, cultural and social life. As noted in the above-mentioned article, “the development and dissemination of information technologies have increased the possibilities for the development of social networks, placing them in the virtual space. The resulting network society has become a socio-media space of global reach, in which the evolving, interfering and constantly transforming infrastructures of media-mediated social networks determine the ways of its organisation.”¹⁰ In connection with the digitalisation of all spheres of life and work, it is necessary to develop and acquire digital competences. Their possession is currently necessary especially in terms of obtaining and maintaining a job – technological progress reduces the demand for physical human work, some jobs are disappearing, and new, hitherto non-existent positions are being created, the labour market is characterised by high dynamics of change and uncertainty. This, in turn, requires continuous improvement and learning.

¹⁰ Ibid., p. 38.



The future of education, including of adults, will be determined by the next stages of the development of the digital space. The next milestone we are currently experiencing is the emergence and development of artificial intelligence (AI) and the generation of feedback using almost all available web resources (ChatGPT). These will be further areas that require assimilation, mastery and skills of use. We will soon find out what direction the future of education will take.

Adult education in Poland

According to data from the population survey of the Human Capital Balance study from 2022/2021 (BKL 2021), the level of educational activity of adult Poles is high. According to the data obtained, 83% of people aged 25-64 are developing their competences, **of which 71% in an informal way, and 50% of them use the Internet for this purpose, 36%** in a non-formal way, and 29% in the workplace (coaching, mentoring, observation)¹¹. The presented data show that the most popular form of learning is informal education, including the use of the Internet. The report further points out that “independent use of the Internet for development purposes is by far the dominant way of learning, especially among young people, but it is also systematically spreading among older people. Non-formal education clearly shows an increase in participation in remote training, while the use of in-person training is declining. The data indicate that on-line training has replaced some of the training courses that have so far been carried out on an in-person basis. This applies both to work-related training, as well as hobby or general development training. The need for distance education during the time when restrictions were introduced influenced the development of tools necessary for the provision of remote services, the development of competences of trainers and participants of training and the change of expectations and behaviours of recipients of educational services. Importantly, these changes persisted after the end of the pandemic, so we can venture to say that the COVID-19 pandemic significantly and permanently affected the non-formal education market.”¹²

The results of the Human Capital Balance study in relation to adult education of Poles are optimistic, because they show a high level of understanding of the need for continuing education (according to the idea of Lifelong Learning) in order to respond to the needs of the changing world. In addition, thanks to education and constant development, learners also develop a range of so-called general competences, which have been included among the basic learning outcomes, but also as the so-called competences of the future (non-professional). These include¹³:

- ability to analyse factors affecting the variability of our surroundings – in the sphere of culture, science and education (orientation in the world) – and ability to design and take appropriate actions,

¹¹ Bilans Kapitału Ludzkiego 2022/2021. Rozwój kompetencji – uczenie się dorosłych i sektor szkoleniowo-rozwojowy. Opracowanie zbiorowe. Polska Agencja Rozwoju Przedsiębiorczości. Uniwersytet Jagielloński. Warszawa 2022, s. 11. [Human Capital Balance 2022/2021. Development of competences – adult learning and the training and development sector. Collective study. Polish Agency for Enterprise Development. Jagiellonian University. Warsaw 2022, p. 11.]

¹² Ibid., p. 12.

¹³ Kwiatkowski S. M., „Kompetencje przyszłości” w: „Kompetencje przyszłości” pod red. S. M. Kwiatkowskiego, Wydawnictwo Fundacji Rozwoju Systemu Edukacji, Warszawa 2018, s. 19. [“Competences of the future” in: “Competences of the future” ed. S. M. Kwiatkowski, Publishing House of the Foundation for the Development of the Education System, Warsaw 2018, p. 19.]



- knowledge of philosophical trends and – their derivatives – value systems and conduct in accordance with one's own value system.

In turn, these skills are based on competences: language, socio-civic, natural, self-knowledge, self-education and interpersonal communication.

Threats of the digital reality

When analysing the subject of the use of ICT tools in adult education, it is impossible not to mention the risks posed by digitalisation. Their source is the process itself, that is, the development of digital technologies, described as follows: “at the end of the 20th century, two processes took place: the convergence of digital media and the networking of computers. They caused cyberspace and virtual reality to emerge parallel to the natural world¹⁴.” This process has resulted in the fact that today we live in conditions that have no historical precedent. It can even be said that we are creating and founding a new world – an inseparable combination of the real and digital worlds. In addition to the undeniable benefits that this synergy brings to humanity, it is not free from threats and dangers for its users. They are all the more dangerous because they are new and hitherto unknown, and no responses have been worked out to them.

The biggest challenge for users is the excess of information that comes in from all sides. This makes it difficult to balance two realities: real and virtual. According to observers and researchers, it is much easier for younger generations to feel comfortable in these conditions, for whom they are already natural¹⁵.

The main pitfalls and dangers of the digital world include: the multitude of available content, with varying degrees of credibility; specific behaviours associated with the perpetration of various forms of violence and aggression taking place in both worlds (virtual and real); digital addictions; ethical threats; the disappearance of independent thinking and in-depth reflection; civilisation diseases – among others illnesses of sight, the musculo-skeletal system, as well as in the mental sphere. The remedy for digital threats is to develop the ability to think critically and selectively navigate the web¹⁶.

The ability to critically, reflexively and selectively use web and information technology resources may soon prove to be one of the core competencies of the future, essential for every person. This, in turn, poses new challenges to education as a field, including adult education, but also new opportunities and possibilities for development.

¹⁴ A. Andrzejewska „Wyzwania i zagrożenia przestrzeni cyfrowej dla edukacji i aktywności zawodowej”, w: „Kompetencje przyszłości” pod red. S. M. Kwiatkowskiego, Wydawnictwo Fundacji Rozwoju Systemu Edukacji, Warszawa 2018, s. 378. [“Challenges and threats of the digital space for education and professional activity” in: “Competences of the future” ed. S. M. Kwiatkowski, Publishing House of the Foundation for the Development of the Education System, Warsaw 2018, p. 378.]

¹⁵ Ibid., p. 387.

¹⁶ Ibid., p. 388.



Summary

The digital world has opened the door to many fields so widely that education, including for adults, is literally within reach. All it takes is motivation and the desire to look for the best solutions for oneself to be able to constantly develop and improve one's competences. At present, it is even a requirement of effective functioning in a dynamically changing world. Changes taking place in the sphere of information, technology and, above all, the labour market, force adults to constantly develop. For this purpose, a variety of forms and tools of education, including remote and hybrid learning, are used, among others, through on-line courses, educational platforms, podcasts, live, social media, etc. In this way, education is within reach and is not directly related to the person of the teacher in the traditional sense of their role.

The dynamic development of digital technologies means that educational opportunities for adults are constantly increasing, and the offer of education itself more and more often goes beyond the previously known and used models and forms of teaching. A particularly important catalyst for education using digital resources in recent times was the COVID-19 pandemic, which forced changes in the approach to teaching and accelerated the use of digital tools and resources in the learning process.

Communication and information technologies have become a fixture in the world of modern education, and their use, including in the offer for adults, is increasing practically every day. The use of ICT network resources and tools is already one of the main areas of key competences. Additional skills related to navigating the digitalised world, i.e. critical and selective use of web resources, are also becoming more important. They are a response to the threats generated by the unlimited amount of information and data being shared.

The future of adult education is inextricably linked to the development of modern technologies. Further milestones in this area will be determined, among others, by the development of artificial intelligence and the use of large data sets.



References

1. Bilans Kapitału Ludzkiego 2022/2021. Rozwój kompetencji – uczenie się dorosłych i sektor szkoleniowo-rozwojowy. Opracowanie zbiorowe. Polska Agencja Rozwoju Przedsiębiorczości. Uniwersytet Jagielloński. Warszawa 2022. [Human Capital Balance 2022/2021. Development of competences – adult learning and the training and development sector. Collective study. Polish Agency for Enterprise Development. Jagiellonian University. Warsaw 2022.]
2. Andrzejewska A. „Wyzwania i zagrożenia przestrzeni cyfrowej dla edukacji i aktywności zawodowej” w: „Kompetencje przyszłości” pod red. S. Kwiatkowskiego, Wydawnictwo FRSE, Warszawa 2018. [“Challenges and threats of the digital space for education and professional activity” in: “Competences of the future” ed. S. Kwiatkowski, FRSE Publishing House, Warsaw 2018.]
3. Błęszyńska K. M., Orłowska M., „COVID-19 jako katalizator zmian w edukacji dorosłych”, w: „Wyzwania edukacyjne czasu pandemii COVID-19”, Pedagogika Społeczna nr 3-4 (81-82), Rok 2021. [“COVID-19 as a catalyst for changes in adult education”, in: “Educational challenges of the COVID-19 pandemic”, Social Pedagogy No. 3-4 (81-82), 2021.]
4. Kwiatkowski S. M., „Kompetencje przyszłości” w: „Kompetencje przyszłości” pod red. S. M. Kwiatkowskiego, Wydawnictwo Fundacji Rozwoju Systemu Edukacji, Warszawa 2018. [“Competences of the future” in: “Competences of the future” ed. S. M. Kwiatkowski, Publishing House of the Foundation for the Development of the Education System, Warsaw 2018.]
5. Mikołajczyk K. „Nowe trendy w kształceniu dorosłych”, Broszura Ośrodka Rozwoju Edukacji, Warszawa 2011. [“New trends in adult education”, Brochure of the Centre for Education Development, Warsaw 2011.]
6. Mikołajczyk K., „Rola Internetu w upowszechnianiu edukacji dorosłych”, w: „Przestrzenie i miejsca edukacji dorosłych w Polsce”, pod red. M. Gromadzkiej, Wydawnictwo Fundacji Rozwoju Systemu Edukacji, Warszawa 2018. [“The role of the Internet in promoting adult education”, in: “Spaces and places of adult education in Poland”, ed. M. Gromadzka, Publishing House of the Foundation for the Development of the Education System, Warsaw 2018.]