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Supporting Homeschooling with Modern Information and Communication Technologies

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ABSTRACT

This paper aims at reviewing the opportunities provided by new digital media in the contemporary educational environment in the context of the needs of parents who homeschool their children. The subject is important as it seems that the development and easier access to new information and communication technologies (ICT) may become both a factor that influences parents' decision to take up homeschooling and an element that significantly supports the very educational process.

In the article, the authors attempt to answer the question of how, based on new information and communication technologies, we can build a personalized educational environment for homeschooling, and which digital tools and resources can be used for this purpose. In the first part, new trends in education and homeschooling development were described. Then, the authors classified and discussed online services and tools that may be useful in homeschooling. They were arranged according to the functions they perform, taking into account information resources, didactic materials and aids, as well as means of digital communication. Also, the authors provided the

results of surveys carried out among Polish homeschooling families that were related to the use of new digital technologies. In the conclusion, the authors enumerated the advantages of a digital educational environment for homeschooling.

Homeschooling and new educational trends

The increasing interest in homeschooling in Poland results from many different factors. They include the ineffectiveness of the institutional schooling system with reference to an increasingly diverse group of children and youth, as well as educational trends that promote the idea of a greater individualization of the educational process. This individualization should include the scope of the educational content, the curricula to be fulfilled, as well as the selection of proper didactic aids and forms of teaching. Contemporary assumptions and guidelines of pedagogy or psychology emphasize the need to release and support the student's natural developmental predispositions.

Władysław Puślecki (1996: 43) draws our attention to several factors that play an important role in stimulating a young person's psychophysical development. One of them is the child's freedom to make decisions and create the whole process of development. If we do not impose the principles of behaviour and the requirement for blind obedience on the child, we provide him/her with the opportunity to develop creative attitudes towards life. Allowing young people to bear responsibility for themselves, their behaviour and educational progress, we help them shape their sense of responsibility for their own development. Such attitude of trust and openness to their way of looking at the world reinforces their self-confidence in making decisions and perseverance in the fulfilment of those resolutions. An example of such way of thinking is the experience described in the book *I've Never Been to School* by Andr e Stern (2016). He learnt about the world, studied and acquired new skills because of his natural curiosity and internal need. Such an approach to the child's education may result in the fact that the curiosity of the world shall accompany him/her in their adult life and that, irrespective of their age, they shall be still willing to learn and acquire new skills. At present, the idea of continuous learning is getting more and more popular. Constant changes, expectations and requirements of the surrounding world contribute to the fact that the individualization of education is a necessity. Ken Robinson notes that

with all the challenges we are facing, education does not need a reform; it needs transformation. The key to such transformation is not the standardization of education, but its personalization, building achievements based on discovering the talents of each child, placing the students in the environment in which they want to learn and they can naturally discover their true passions (Robinson, Aronica 2012:198).

The parents who have decided to homeschool their children were often inspired by the idea of the individualization of the educational and upbringing process.¹ While analysing the utterances of homeschooling parents, we can note repeated opinions that one of the greatest advantages of homeschooling is the opportunity to recognize and follow the individual needs of the child. Such approach makes it possible to develop the child's curiosity and willingness to know and understand more. As a result, children are more involved in gaining new information and skills, and they become self-reliant explorers of the world. Adjusting to the child's way of studying, as well as discovering his/her natural predispositions and aroused interests are the foundations for creating a releasing educational environment. As the child is getting older, the organisation and planning of education, as well as the responsibility for its direction and progress, is taken up by the young person. Marek Budajczak, who was one of the first parents in Poland to take up homeschooling, emphasizes that a homeschooled child

participates in planning his education from the very beginning. He/she is not a passive "vessel" for any content. Instead of activating their mechanic memory only, they use and improve their ability to order the meanings, as well as store and use knowledge. They do not have to hide their true attitudes, and they can negotiate the conditions of a given situation. Since parents trust them, they can make choices that determine the shape of their future tasks (Budajczak 2004: 93).

The opportunity to use educational resources offered by the Internet is a great support for homeschooling families. The 21st century is the time when the access to information is shaped by dynamic technological changes. The development of digital techniques changes the reality of the contemporary man very quickly. Such changes refer to many areas of everyday life, and one of them is broadly understood education. The ability to use computers and information technologies gives us the chance to individualize education. Marzena Kędra (2016) emphasizes that it is enough if we

let the child experiment, experience and explore, discover and compare, browse through books and huge Internet resources, where he/she can satisfy their curiosity about various areas of knowledge. We should help the child set out for interesting journeys – sometimes difficult and sometimes exciting ones – so that he/she can find what is interesting and fascinating for them.

According to K. Robinson, due to new information and communication technologies (ICT) "we are given unlimited opportunities to engage the imagination of young people and provide them with the forms of studying and teaching that are adjusted to them in the best possible manner" (Robinson, Aronica 2015: 6).

¹ On the motivation for the parents' decision to start homeschooling, see, e. g. M. Budajczak (2004: 86-90), P. Bartosik (2009: 49-59); B.D. Ray (2011: 19-26). Also, the authors analysed the utterances of homeschooling parents posted in social media and on the blogs they write.

Research analyses show that the huge increase in the number of resources available on the Internet and the kind of relations made through the network significantly influence the change in perceiving the role of a teacher in the educational process. Witold Kołodziejczyk and Marcin Polak emphasize that the teacher is no longer perceived as the provider of knowledge, but he/she starts to perform the function of a mentor and guide. The teacher of the 21st century is to show the student how to learn, how to obtain reliable and credible information, and how to prepare for functioning in the modern society in which the young person shall live and work (Kołodziejczyk, Polak 2011: 53-55). Parents are also aware of the changes and – according to Brian D. Ray – they “stop treating teaching as something reserved for people with a special «anointment»” (Ray 2011: 22). More and more of them start homeschooling their children, supporting them in the development of the competencies needed in the modern world. In order to do this, they are searching for proper resources, tools and educational aids to create a friendly educational atmosphere at home.

Building educational environment for homeschooling based on new technologies

By deciding to start homeschooling, parents become obliged to provide their children with the proper educational environment to support the student in various activities related to the individual process of learning. Such an environment may be built on the basis of the commonly available, paid and free, Internet resources and services. Broadly understood information and communication technologies (ICT) not only make it possible for a young person to gain new knowledge and competencies, but they also become a space for creation, the presentation of one’s work, broadening one’s horizons and contacting other people. The following are the examples of online services and tools useful in homeschooling. They are arranged according to the functions they perform.

Information resources available in the Internet

One of the basic elements of an educational environment are information resources. At the moment, the Internet is their main repository. Sometimes, the name of the World Wide Web is ironically translated into Polish as *Wszecznicza Wiedzy Wszelakiej* (*the Collection of All Kinds of Knowledge*). This name properly reflects the nature of virtual resources, because the dynamics of the development of the Internet shows that, apart from valuable information, what we can find in the web is incomplete, old, or even biased or purposefully falsified information. While analysing the Internet as a source of knowledge of the world and its processes in the educational context,

we should remember to use reviewed materials. Also, it is worth taking into account that using the Internet resources is a lesson of verifying the provided information, which, at the time of the Internet lie, post-truth and fake news, is a very important skill. Nowadays, the Internet may be treated as a great and very abundant source of information provided that we use valuable and approved websites and we have a critical approach to the content published in the web.

Parents who are preparing to use Internet resources in homeschooling have to constantly select the sources and choose renowned publications prepared by official institutions or editorial boards which provide reliable and objective knowledge. The list of valuable educational websites is long. In Table 1 we have presented various types of information resources available in the Internet, and we have illustrated each type with several examples.

Table 1. The examples of information resources useful in creating the educational environment for homeschooling.

No.	Category	Examples
1	encyclopaedias, dictionaries, lexicons, translators	Wikipedia, Encyklopedia PWN, Britannica, Interia (encyclopaedia and lexicons, descriptions), Google Translator, DeepL
2	Internet libraries, online books, handbooks,	Wolnelektury.pl (with the possibility to download them in various formats for ebook readers), Polona, Wolne Podręczniki,
3	magazines and their digital archives	National Geographic, Wiedza i życie, young technician (Młody technik)
4	maps, atlases, guide books	Google Maps, Kula.gov.pl, Google Earth+, Open Street Map, HERE We Go
5	collections of photos, images, infographics	Flickr, Instagram, Pinterest
6	films, audio recordings	YouTube, Vimeo, VOD platforms – documentaries, educational programs, e. g. Sonda2
7	services dedicated to particular subjects	Internet atlas of birds, Kopalnia Wiedzy.pl, Edunauka.pl
8	virtual galleries and museums	The Royal Castle in Warsaw – virtual tours, virtual museums of the Lesser Poland, Louvre – online tours, the British Museum – Collection Online, Online Science Museum, Lascaux – visite de la grotte, virtual walks in the ZOO (e. g. in Wrocław)

Source: the author's own collection

Since they are so easy and convenient to use, in recent decades Internet encyclopaedias have almost completely superseded their traditional paper versions. In particular, the phenomenon of Wikipedia has shown that the community of Internet users is able to create a collection that, in many situations, can compete with renowned publications, such as Encyclopaedia Britannica. However, while using such works, we have to remember that we should verify the information or treat it as a starting point for discovering the proper and more exact sources of information.

A similar, yet much slower, process of transformation refers to dictionaries and various kinds of lexicons. Due to the limitations related to copyrights, the access to full texts of books or monographs is not developing as dynamically as the access to encyclopaedias and lexicons. However, many projects, especially those that are based on the idea of open resources, offer various books free of charge. The examples of such services include Wolnelektury.pl or Wolne Podręczniki. Also, texts that are a part of the Polish national heritage are slowly being digitalized, e. g. within the project carried out by the National Library – Polona which publishes scanned literary texts, scientific works, documents, photos, or music notes.

Open Educational Resources are a popular form of making educational materials available to students and teachers. Such resources mainly include materials that can be accessed free of charge in the Internet. Those who use them are given the right to develop and modify them (Grodecka, Śliwowski 2014). The authors of *Przewodnik po otwartych zasobach edukacyjnych (The Guide to Open Educational Resources)* recommend many materials on different topics, including browsers dedicated to using open resources, such as Search.creativecommons.org, Let's CC and repositories of multimedia materials such as Wikimedia Commons and flickrCC. In the guide we can find many addresses of handbooks that are made available for free and grouped according to the topics they refer to.

Multimedia are a very important part of the modern educational environment. In this case, too, the Internet may be a precious source of educational materials. Educational films and channels provided in the services such as YouTube may be an interesting and attractive form of presenting new educational contents to a young person. Also, virtual tours are getting more and more popular. During such tours we can visit historical buildings and other places that are far away or difficult to access. Using the Internet, we can take a virtual walk in the Wrocław ZOO, admire the drawings on the walls of the Lascaux cave, walk along the corridors of Louvre or other famous museums, or – through Google Earth – travel to the moon. Also, parents appreciate YouTube lessons (there are special channels dedicated to physics, mathematics, natural sciences, etc.), university lectures or presentations.

Khan Academy – a specialist educational portal, offers an interesting system of individualized lessons based on brief films and related exercises. Its Polish version is

poorer in comparison to the original American version, but this form of education – especially mathematical – is developing fast and has a great potential. The materials presented in Khan Academy are well prepared from the methodological point of view. The films can be presented in cycles that form a particular whole, and they are accompanied by interactive exercises. Moreover, one can trace the student's results from the account of the student and the parent.

Didactic materials and aids available in the web

Not only does educational process include gaining new knowledge, but it also comprises repetitions of the content that had been learnt and a regular control of the progress, so, from the homeschooling parents' point of view, ready didactic aids available in the Internet may be very useful. Such materials are prepared by educational institutions or individual teachers. While browsing through the web, we can come across many educational services that offer a wide base of educational materials, lesson plans, worksheets and example tests. One of such rich repositories of didactic aids is, e. g. the Scholaris portal. Its browser makes it possible to browse through the materials according to the educational stage, subject, type of resource, or licence. Also, in the Internet there are numerous blogs of teachers who share their ideas and publish their own teaching aids. Also, homeschooling parents share their own experiences and materials in various websites. Using these resources, homeschoolers may either use them in the form suggested by the authors, or they can create their own educational materials inspired by the ideas or the way of analysing particular subjects.

Table 2. Didactic materials, as well as Internet tools and services useful in creating the virtual educational environment

No.	Category	Examples
1	Educational services with didactic materials, multimedia resources, interactive quizzes and tests, lesson plans	Scholaris, Khan Academy Ninateka, Muzykoteka szkolna, Internetowy Polski Słownik Biograficzny, Kula.gov.pl, Włącz Polskę – a set of educational materials for Polish children studying abroad, Bezpieczny Internet [Safe Internet], Sieciaki, Necio
2	Educational mobile applications (for tablets and smartphones – searching, information and recommendations, educational games, Edutainment	enauczanie.com – mobile education, Superbelfrzy.edu.pl – Edu-granie

No.	Category	Examples
3	Online edition of documents – texts, calculation sheets, presentations	Google Documents (Google Drive), Google Sheets, Google Presentations (Google Drive)
4	Storing and collecting documents	Google Drive, Dropbox,
5	Planning and taking notes	Google Calendar, Evernote, Google Keep, Evernote, Google Documents
6	Publishing one's own materials (texts, multimedia presentations) in the web	Google, Drive, Slideshare, YouTube, tools used in Digital Storytelling
7	Creating e-portfolio, virtual files with works	Blogs (Blogger), WWW sites, wiki, Dropbox
8	Searching for educational resources on open licences	CC Search (https://search.creativecommons.org/)

Source: the author's own work.

While analysing the process of education in the context of the type of cognitive actions, the elements that engage the student and promote his/her active attitude are much more valuable than those which create the situations in which the child is just a passive recipient of the content provided. The analysis of new trends in education indicates an increasing popularity of educational games as a form of learning through fun. This way of the child's contact with didactic contents is very attractive for a young recipient. In this scope, the offer of digital resources is not developed enough. It basically includes very simple applications and programs, but we can find many valuable materials that use the element of a game in the web.

The educational method of *digital storytelling* is another way of engaging the student in the educational process. The idea of using digital storytelling in education is based on the conviction that the stories created by the students themselves with the use of the new media make it possible to learn the content easier, especially in the area of historical events, political issues, social or environment protection problems. Making brief, multimedia stories using photos, films, animation and sounds, not only extends the students' knowledge of a given phenomenon or problem, but it also builds their emotional attitude to the educational content, teaches critical thinking, making objective assessments, presenting one's opinions, etc.

Another group of materials which are useful from the point of view of conducting the process of education at home includes mobile applications. The materials available in a tablet or a smartphone can easily be taken on a trip, a walk in the park, or a visit

in an art gallery. While sightseeing, we can also use more and more popular applications and guides using the elements of *augmented reality* which integrates the real and the virtual world into one. At the moment, mobile devices available on the market provide the users with great opportunities. Apart from purely communicative functions, in many situations they can replace desktop computers, e-book readers, cameras or sound recording devices. They provide us with an easy Internet access, and they enable us to edit documents and files recorded in different formats. An interesting review of practical applications of mobile devices in educational contexts can be found in the cycle of publications: *Mobilna edukacja* (Hojnacki, ed., 2011, 2013). A part of the articles include various issues from the point of view of a teacher, and the other part – from the perspective of a student. It is worth emphasizing that adapting mobile devices for the needs of the process of education meets the expectations of young users who already belong to the generation that has grown up in the digital era.

An important element of the process of education includes constant monitoring of the results and the assessment of the level of knowledge and skills acquired by homeschooled children. Apart from the official verification made by educational institutions, it is necessary to teach the child how to evaluate his/her own achievements. In order to do this, we can use interactive exercises and tests published in the web. An e-portfolio is an interesting solution that can show the student's results. The virtual portfolio can perform many different functions. It can be a record of the homeschooling process, a review of the student's works, a list of achievements, a collection of documents that confirm the student's participation in projects, youth organisations, sport competitions, voluntary campaigns, etc. In the report: *Homeschool Portfolios*, the authors particularly emphasize the meaning of the documentary and diagnostic functions; in this way, the student's achievements can be accessible for educational institution that makes an official assessment, or for future employees. Such an electronic version of the students' achievements may include photos, graphics, sound and video recordings, as well as links to other websites and data bases. Thus, technology can support all the educational activities taken up by the child and his/her parents.

Means of electronic communication as an important element of homeschooling

The process of education cannot be carried out in isolation. It is very important for the children to contact with peers and experts, and to participate in the life of the local community. Unusual interests and the need to communicate with groups of people who share their unique hobby facilitate young people's willingness to search for contacts in the Internet. Due to communication technologies, we can quite quickly find and use the knowledge and experience of other people. In this scope, information and communication technologies can be an effective tool for a homeschooling parent.

The examples of communication services provided through the web, which seem to be necessary in homeschooling, are presented in Table 3.

Table 3. The examples of communication services that seem to be necessary in creating the virtual homeschooling environment

No.	Category	Examples
1	Social media	Facebook, Twitter, Pinterest
2	E-mail	Gmail, Outlook, etc.
3	Instant messengers, videoconferences	Skype, Google Hangouts
4	Tools for group work, sharing files and resources	Google Drive, Google Documents, Dropbox

Source: the author’s own work.

At the moment, peer communication is based on social media services. They make it possible for young people to create a network of contacts, and they ensure easy communication with other people who, e. g. have similar interests, share the same passions or take up various activities together. Using such tools, we can easily take part in the work of a project team even if its members are far from one another. Social portals provide great opportunities in the scope of choosing the form of interaction among the users. Apart from posting messages and discussing on forums, their users can chat with one another, share different files, multimedia materials, etc. The systems of notifications make it possible for a person to read all the new contents posted on such websites.

Among other communication services and tools, the role of e-mail systematically decreases, but if we want to function in the Internet, we must have an e-mail address. And the tools which are still underestimated in education include team work tools that make it possible for people to share files and documents, and edit them online. From the perspective of homeschooling, in which the children do not always remain in a direct contact with their friends, such tools have great potential. This situation is particularly good for those families which live in smaller towns or villages, and in their neighbourhood there are no other homeschooling families or families with similar interests.

The use of information and communication technologies (ITC) by homeschooling families

The experience of using new technologies in homeschooling is still not very well documented and described in scientific literature. Many articles discuss the role of new media and their meaning for the process of education. Being aware of the great potential of the new means of digital communication, some scientists from Malaysia have described the model of organizing and providing educational contents for homeschooling based on technological devices. On the basis of the opinion of a group of experts and the experience of families who have been homeschooling for at least five years, seven basic elements of the model of homeschooling based on technologies were distinguished. Those elements include: social media services, information and educational materials available online, educational applications and services using the resources available in the web (e. g. online courses, Web Quests), Mlearning, i.e. mobile learning, interactive video games, Internet portals, and multimedia tools using photos, films and animations within the method of *digital story-based learning*. According to the analyses, social media services, such as Facebook, but also Twitter, Myspace or Google+, along with the use of mobile services, telephone or tablet applications, constituted the basis for organizing homeschooling. Also, homeschooling families appreciate all kinds of generally available information resources (Wiki, blogs), educational materials published on the web, as well as local educational services that contain example tasks and tests. What is the least popular among homeschooling parents are interactive games and large Internet portals that provide the users with such services as e-mail, chats, etc. Their role in creating educational communities has been taken over by social media portals (Alias, Rahman, Siraj, Ibrahim 2013).

Also, we do not have much information on how Polish homeschooling families perceive new technologies. In 2015, during a meeting of families homeschooling in Poland, within the research needed to write a master's thesis, a young researcher carried out an analysis to collect data on using digital educational resources in homeschooling.² The meeting of homeschooling families was held in a private Montessori school in Koszarawa Bystra. Fifty people took part in the research and the method used in the analysis was a diagnostic survey. First, the parents filled in a survey, and then, a non-categorized interview was used to complete the selected issues. Women constituted 63% of the surveyed parents. The majority (91%) of parents had a university degree. Half of the families which took part in the research lived in the countryside. A small

² The research was carried out by Marta Spuła who was writing a master's thesis entitled *The Use of New Information and Communication Technologies in Homeschooling* under the supervision of Dr Irena Pulak at the Jesuit University Ignatianum in Kraków.

town (up to 100,000 inhabitants) was indicated by 23% of the respondents, and large cities (more than 100,000 inhabitants) were home to 25% of the families. Large families (with at least 3 children) were the majority of the families taking part in the meeting. Only 9% of the participants declared they had been homeschooling for 3 or more years; 34% had been homeschooling for 2 years; and 27% – only for a year. Quite a lot of them, i.e. 30% of the families, had just begun the process of homeschooling.

The age of the children from the surveyed families was 0-20 (altogether 125 children). The largest group of children included 4-7 year-olds (45 children). There were 41 children aged 8-12. In the researched families, homeschooling mainly referred to one child – 55%; or two children – 30% of the responses.

In the research, the author tried to specify which educational resources are used by homeschooling families. The obtained results indicate that the educational basis of the surveyed families is created with the use of both traditional and digital resources. The most popular digital educational resources include films on YouTube (41% declared that they use them very often), nature and science documentaries available in the Internet and on TV (30% said they use them very often). 16% of the respondents indicated that they frequently use audiobooks. In the interviews, the parents added that they use English films from YouTube and other sources to support their children studying English. Among digital educational resources, websites dedicated to particular subjects are popular (27% of the families), as well as educational services (14%). Educational platforms (7%) and educational computer games (5%) are less appreciated.

When asked to indicate the most interesting digital materials and sources, the surveyed families mentioned:

- applications for creating multimedia presentations (prezi.com);
- websites enabling one to write his/her own blog;
- tools that help to collect documentation related to education, including photos of works; such tools make it possible to quickly review and assess the child's works – Google Apps for work;
- educational applications to learn:
 - foreign languages: www.supermemo.pl, www.funeasylearn.com, and – for elder children – www.coursera.org
 - mathematics: pitagoras2000, www.matmagwiazdy.pl
 - programming: www.scratch.mit.edu;
- educational projects prepared and made available by the school with which the homeschooling families cooperate;
- Internet competition websites for children enabling them to cooperate in a particular project;
- educational platforms such as www.squla.pl;

- online boards that enable the creation of mind maps, virtual boards for publishing information for parents and peers (Padlet.com).

Rich multimedia resources of the Internet are, according to the surveyed parents, very helpful in organizing the child's daily activities. Apart from substantial and practical support, such resources provide the parents with many ideas and inspirations. The ability to use the educational materials available in the web is the factor that facilitates homeschooling, and not the factor that determined the families' decision to choose such a form of education. Kinga Pukowska, a homeschooling mum, describes her experience with the use of digital resources in the following manner:

The Internet is a great source of support for me. It is the source of information, but it also helps me to teach children how to critically filter the information we find. It is because not everything we find in the web is true. However, the fact is that the ability to access the Internet knowledge from home facilitates homeschooling and helps to find the answers to most of our questions. Also, the Internet helped my children to become familiar with English. My older son (1st class of the junior high school) already speaks English quite well, although when he quit the traditional school in November 2015, he could not deal with the basics. Watching interesting films on YouTube, good books, meetings with English-speaking youth, and then an exam conducted in a wonderful manner, resulted in the fact that English has become something natural and useful for him (Pukowska 2017).

Conclusion

Not only do new digital tools and media change the way in which we obtain information, but they also diversify the forms of our communication, shape some attitudes and behaviours, and allow us to develop innovative methods of studying based on new technologies.

It is obvious that the ability to use new technological tools is not enough to consciously, responsibly, safely and creatively use the Internet resources. It is also necessary to support the development of children and youth in the area of soft digital competencies. Thus, not only should we pay attention to the conscious use of ICT, but we should also care about building the culture of the virtual world on the basis of the values such as truth and responsibility. Moreover, in a cyberspace which is full of lies and fake news, key skills include verifying information, data analysis and critical thinking.

The contemporary young generation includes people who will probably be performing jobs that do not exist today. The future will be based on new technologies and the opportunity to learn and use ICT in the process of homeschooling should

make children educated this way more competitive on the future job market than the children educated in traditional schools where such skills are still marginalised.

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