

EMPIRICAL RESEARCH OF DEPENDENCE BETWEEN ENVIRONMENT AND DIGITAL LITERACY OF PRESCHOOL AND PRIMARY SCHOOL CHILDREN

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ABSTRACT

The paper presents a study that shows different aspects of the influence of the environment on the development of digital skills of preschool and primary school students. A relationship between the use of technologies by the adults from children's environment and the formation of their ideas and skills to use technologies as a means of achieving a goal is under investigation.

The relationship between the environment in which children grow and their motivation to learn new knowledge among students who are focused on activities related to technology and those who are trained in a standard learning environment is studied.

Some relations between the environment in which children live and study and the level of their digital skills are under investigation. The authors investigate factors such as the digital literacy of the parents, the family conditions as standard of life, the technological equipment of the learning environment at school, the level of digital literacy of the teacher, and so on. Especially critical is the use of Internet technologies and social networks by children of preschool and primary school age.

Keywords: digital generation, digital literacy, environment, internet technologies

Introduction

Contemporary children also called “digital generation” grow up and develop themselves in a technologically rich environment. They form their views for the world and find their place in it based on their everyday experiences, family, school and internet environment.

When creating mechanisms for forming a child’s personality and a worldview in the conditions of a technological society, pedagogical science needs to explore how and to what extent digital technologies are part of these processes.

The article presents studies on the environment in which children develop and learn - digital literacy of parents and family conditions, the digital environment and the conditions in the institution (kindergarten, school), digital literacy and the way the teacher works.

We are exploring the skills and motivation for new knowledge of children who are focused on technology-related activities and children studying in a standard learning environment.

The use of information and communication technologies is part of the digital skills and competences that should form the modern personality. “Digital literacy is the awareness, the attitude and ability of people to appropriately use digital tools and to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, build new knowledge, create media messages, and communicate with other people in the context of specific life situations to enable constructive social action as well as to rationalize this process” (Allan Martin & Jan Grudziecki, 2006).

“Digital competence is a set of knowledge, skills, attitudes (including abilities, strategies, values, and awareness) that are needed when using ICT and digital media to perform tasks, solve problems, communicate, manage information, collaborate, create and share knowledge efficiently, appropriately, critically, creatively, independently, flexibly, ethically, consciously engage in work, leisure time, participation, learning, communication, consumption, and expanding watt and opportunities” (Ferrari, 2012).

Of an utmost importance for the digital competency are the skill needed when working on the Internet, rated as being crucial for “digital inclusion” (Alexander J.A.M. van Deursen, Ellen J. Helsper & Rebecca Eynon, 2015).

Research on the use of information technology and social media by children has increased significantly in recent years. The results indicate that the age limit is diminishing and technology is taking on more and more of their leisure time, studying process, and social relationships (Holloway, Donell & Lelia Green & Sonia Livingstone, 2013), (Sonia Livingstone, Leslie Haddon, Anke Görzig, 2011), (Livingstone, Sonia and Haddon, Leslie, 2009).

The impact of using technology and social media in specific socio-cultural environment of children has not been studied and described in detail.

During the last several years significant changes these years in the use of information technologies and media habits in preschool and primary school children have taken place. They are due to the emergence of new technologies and media, their family and social role (Amante, 2016).

Parental intermediation is a key strategy for developing children's skills to use and interpret media and information technology, to foster positive outcomes, and prevent negative media outcomes. The family and the school occupy a leading position in child's life and it is necessary to define their role in the formation of digital literacy of children.

The new technologies influence the development of the child and his/her role and relationships in family, school, society. The changes in the environment in which children grow up and develop are becoming more and more dynamic. This is as a result of the appearance of new technologies and digital media that are also used by the children from the considered age group.

The attitudes of children show that they are ready to study through digital technologies, all the more so that they are their natural environment and naturally will perceive the presentation of the material with the help of the new technologies (Parijkova, 2017).

Research objectives

The target group of this study are children that are 8-9 years old. The empirical research examines their capabilities to work with information technology. Through a survey, we have reviewed the conditions in which skills and habits for the use of information technologies, the Internet and the media have been developed.

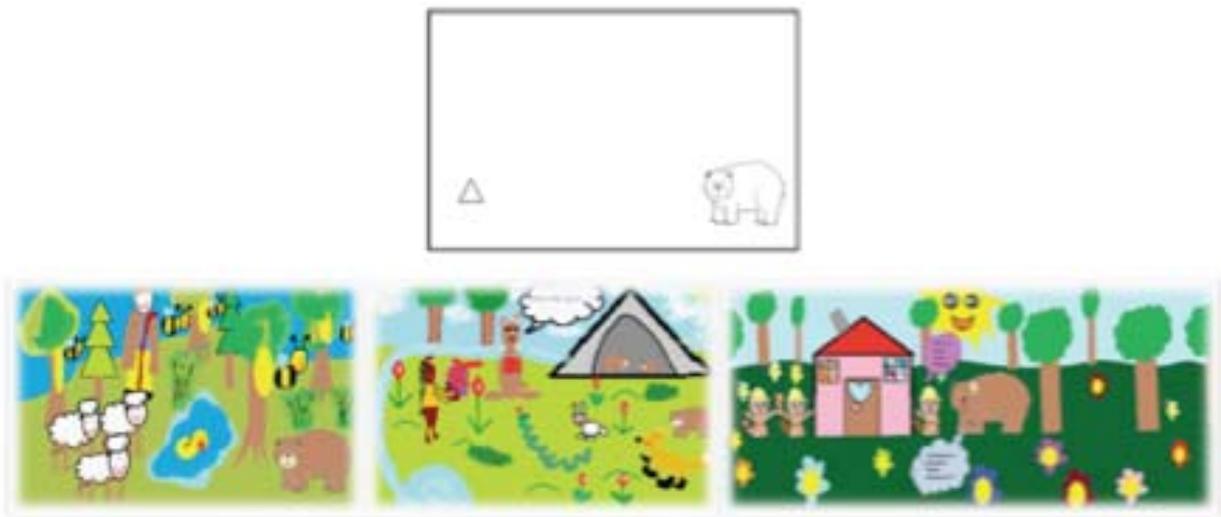
A study with children from all over the country was carried out. Its aim was to identify if the 8-9 year old children are capable to work with information technologies. Children are offered a file in

which two elements have been drawn. They have to finish the drawing according a predefined theme. The theme children are working on is "Spring in the Forest". They work with MS Paint. All children are familiar with the program and the tools. The results show that children who study information technology at school easily use different tools in many ways in order to turn their ideas into a reality. They apply what they have learnt in school when working in a new environment. This demonstrates the transfer of knowledge. There are students who know the environment and the tools, but have not performed systemic tasks to get to know them. These children often use tools that remind them of free hand drawing on a piece of paper (Fig. 1).

An exploration of children's digital capabilities is being done every year from 2010 on a different theme.

The survey presented in this article was conducted with a representative sample of students and their parents. After an analysis of the answers and the results, correction of the questions and the structure of the surveys is being planned, in case it would be needed. After the correction of the surveys it is predicted the study to be conducted with pre-school and primary school children, their parents and teachers throughout the country. It is planned that the scope of the survey will be targeted at different groups of the population with regard to certain aspects such as:

- small, medium and large town, village;
- children who study information technology and who do not;
- children, using different technologies in their education and children who are not;
- parents with a high level of education and those with a low level of education;
- others.

Fig. 1. Work with MS Paint on 8-9 year old children

The purpose of the research is to determine the conditions in which young pupils have been growing up and are being educated in terms of technology and new media.

To accomplish the goal, the following tasks are set:

1. Identify the technologies that parents use.
2. Determine the functional applicability of technologies and new media by parents.
3. Determine parents' attitudes and mediation towards the use of technology and new media by their children.
4. Determine the inclusion of parents in the educational activities of children requiring information technology.
5. Determine how much the responses of children and parents match in relation to Internet usage, social media and other related issues.

The subject of research is exactly how much and in what way technology and new media play a role in the education of children in the 2nd grade and what is the contribution of the family and the school in these processes.

The survey was conducted with two study subjects and an expert opinion of a teacher has been researched.

The pupils are in 2nd grade from a school in Burgas. The city is a big one - the fourth largest in Bulgaria. The school where the surveyed children study is a primary school.

Students have been studying information technology 1 hour per week since they've started first grade. For all subjects, the teacher uses information technology - an interactive board and exercises for it. Since the beginning of the school year, the class has been included in a program where children learn robotics. Once a month, the teacher prepares a task that is related to a certain learning content. It is aimed for realization at home and is called "Child and Parental Task". The task is to search for information on the Internet.

From the description of the surveyed children's school environment, it can be concluded that this is a rich technology environment. The use of technology is controlled and the aim is educational.

The survey, which examines the family environment in terms of technology, is structured into several sections that track the following information:

- for the parent - age, education, marital status;
- the type of devices available in the home;
- the use of devices and information technology by the parent;
- the parent's opinion regarding the use of information technology by his child;
- the parent's point of view regarding the protection of his child's Internet hazards.

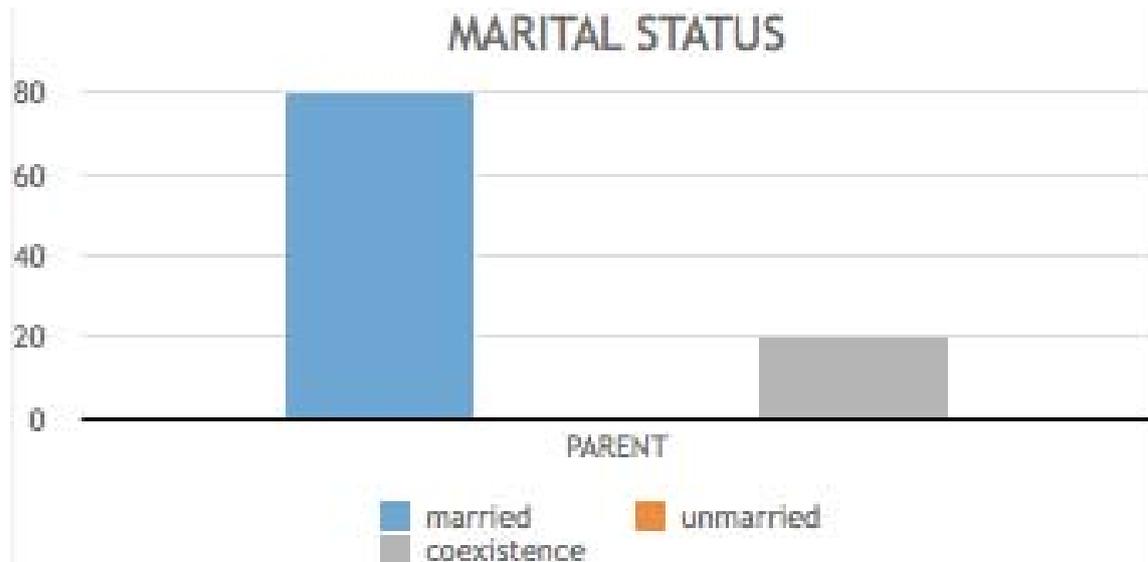
The survey, which explores the environment in which the child develops in technology, is structured into several sections that track the following information:

- for the child - age, family environment
- the type of devices available in the home;
- devices and information technologies used in school;
- use of devices and information technology by the child;
- prevention from online hazards.

Results of the parents' poll

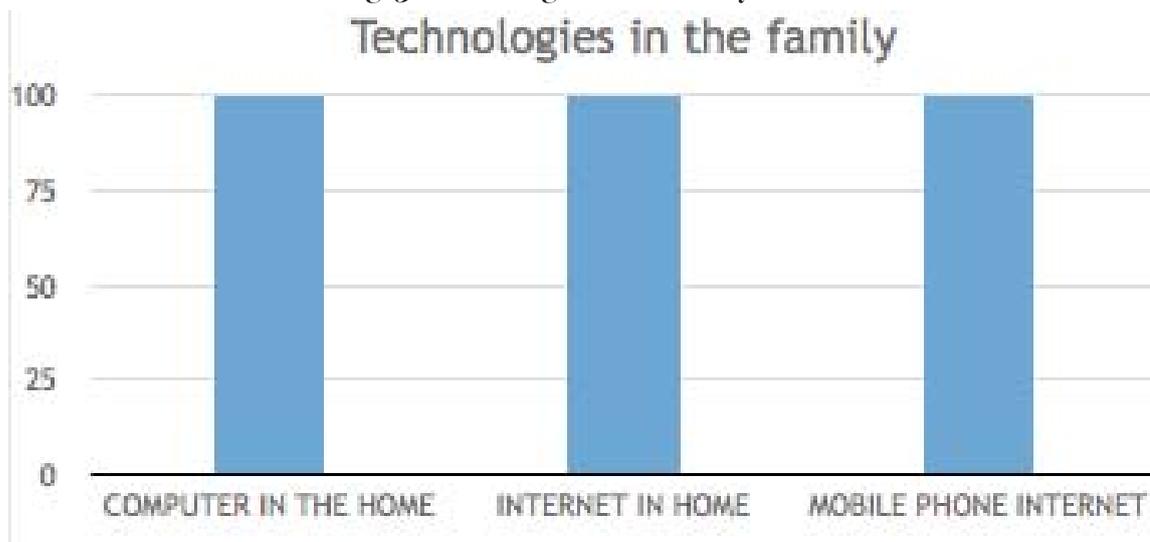
The surveyed parents are aged 33-45. 80% of them have University education. Fig. 2 presents the family status of the investigated parents.

Fig. 2. Family status of parents



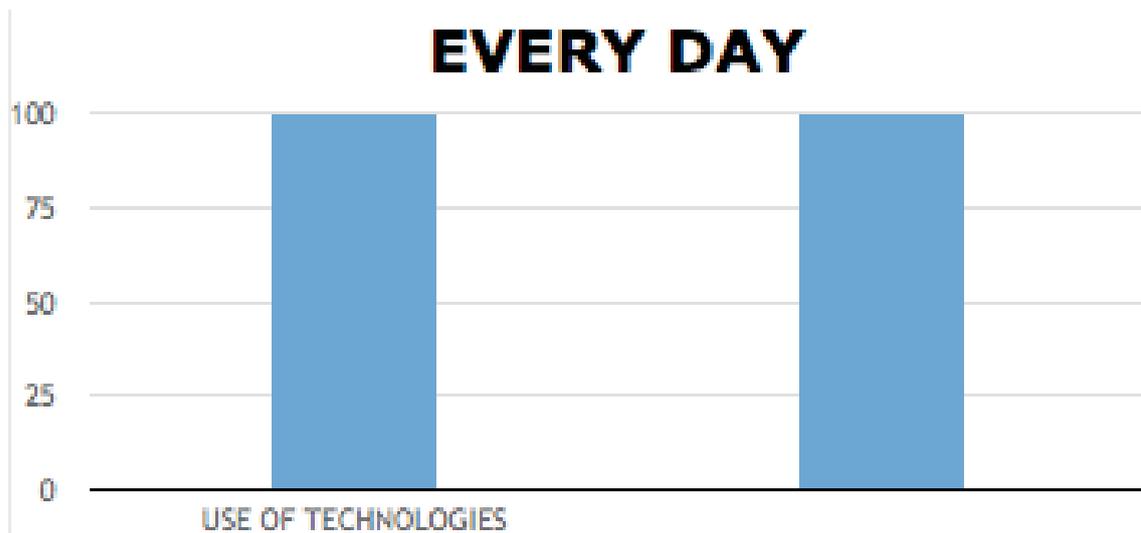
According to the survey, the families have a computer and internet at home. All parents have mobile internet on their phones (Figure 3). These facts show that the model that parents present to their children is technology-bound.

Fig. 3. Technologies in the family



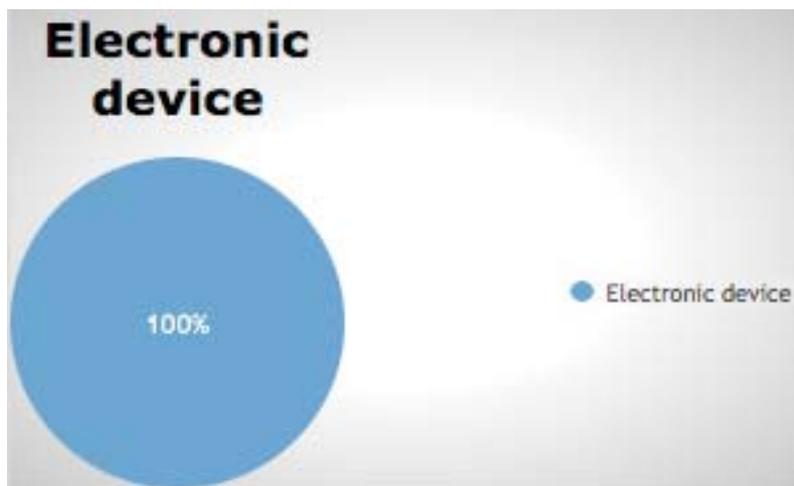
The data shown in Fig. 4 presents that parents use computers and internet in their day-to-day work.

Fig. 4. Use of Technologies



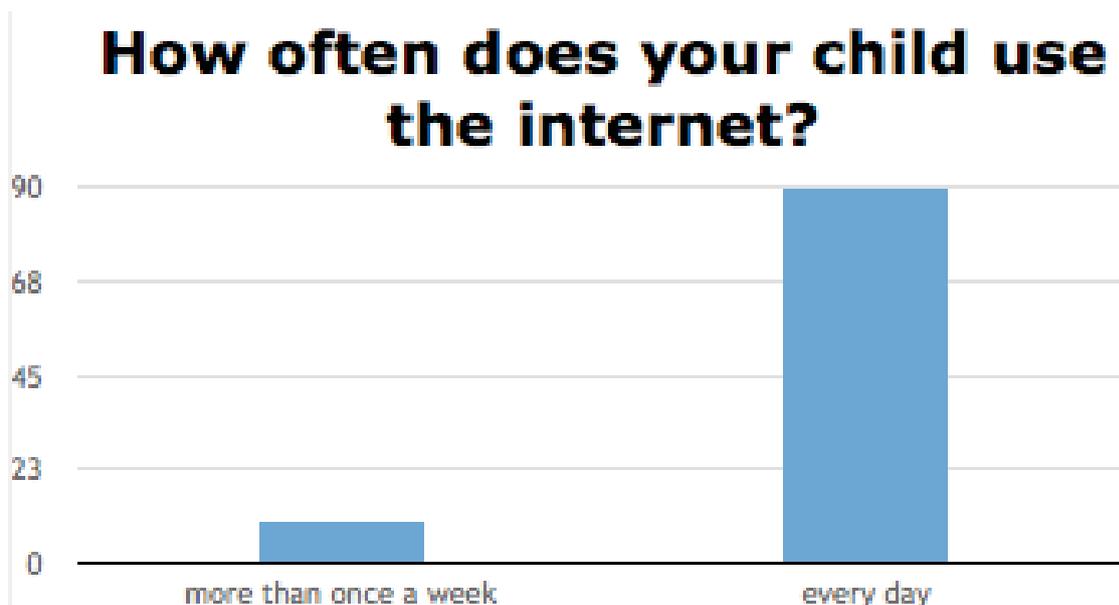
From the following questions, it becomes clear that a computer and specialized programs are being used by parents whose work is related to computer processing. Others use a computer for a connection with Internet, social networks, contacts, movies, books.

Fig. 5. Types of electronic devices that children hold



The second section focuses on parents' attitudes, opinions, and commitment to technology and their children. The question "Does your child own an electronic device?" all parents answered positively. The devices they have listed are tablets, PSP, mobile phones (Figure 5). Only 26% say their children have mobile internet on one of their devices. At this age, children still do not have their own computer, which shows that if the child wants to use the Internet, it will be via home computer under the control of the parent. However, although a small percentage of children of this age have free access to the Internet, consideration should be given about information and prevention. The data presented in Fig. 6 show that parents admit that a huge number of children visit Internet daily. All parents responded that their children were playing when using Internet. When being asked to list sites that the children visit, no parent has written a name or address of a particular site. They describe what children do and what they play. This fact shows that parents do not know exactly where their children go. They do not use the Parental Control function, but rely on the fact that their children are still too young and couldn't get into an unwanted situation.

Fig. 6. Frequency of internet use by children according to parents



The majority of parents indicate that their children are not familiar with Internet rules (Figure 7). The reason according to the parents is that their children just play online, and the games are designed for them. Parents do not take into account the fact that games gradually and

imperceptibly become more and more engaging for children, and they may not know when their child will be involved in a shared game.

Fig. 7. Rules on the Internet

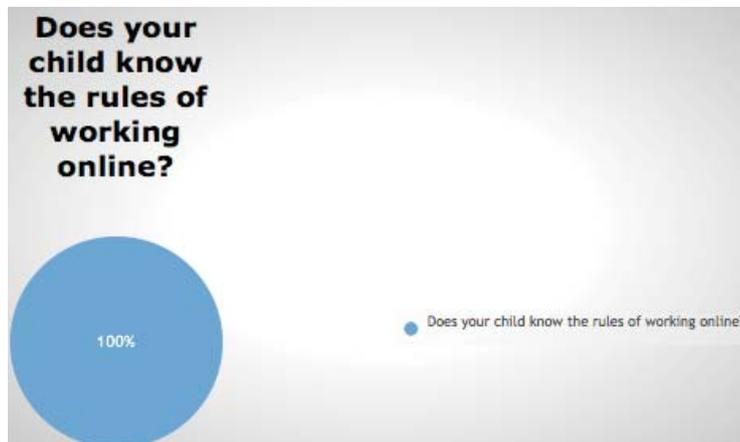
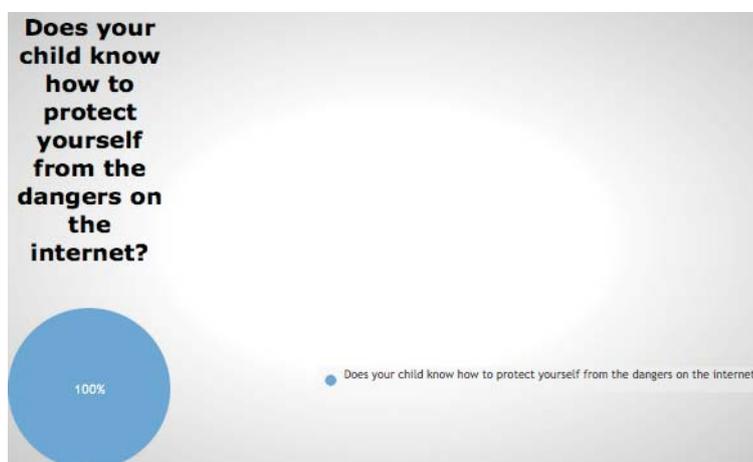


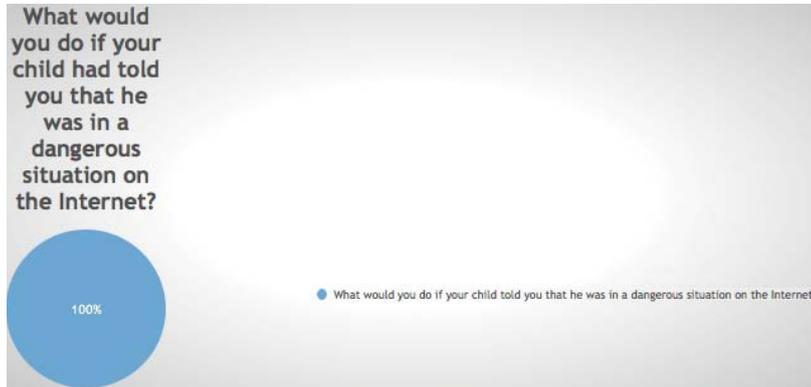
Fig. 8 shows the answers of the parents regarding their opinion whether the child knows how to protect him/herself in internet. They admit that children do not know how to protect themselves. Fig. 8 shows the responses parents gave to what they would do if their child was in a dangerous situation on the Internet. All responses are related to prohibitions that the parent will bring to the child. No parent offers prevention of such a situation. This fact shows that parents are also not prepared for the rapid penetration of technology in their children's lives. When the parents themselves have begun to use technology and the Internet, they have already been awared with built-up habits and control abilities. In modern society, the age limit for using the Internet is decreasing.

Fig. 8. Protect the Internet



In the Bulgarian school students should start using the Internet in 3rd grade. Then they will have to learn the rules for its use. The results indicate that preventative work should begin earlier.

Fig. 9. Parent's actions



Parents intend to ban certain activities for their children. They do not plan to prepare them for the dangers they may encounter.

Results from the students' poll

The class consists of 28 students - 12 girls and 16 boys.

Fig. 10. How often do you use a computer?



Fig. 11. How often do you use internet?

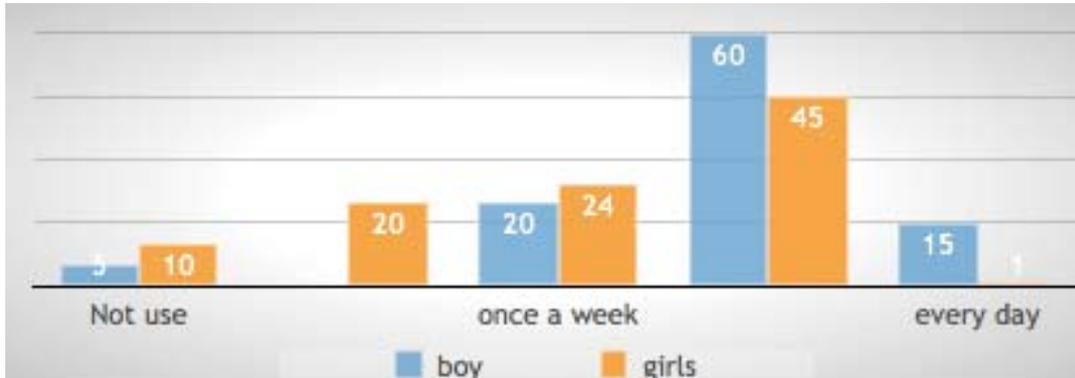
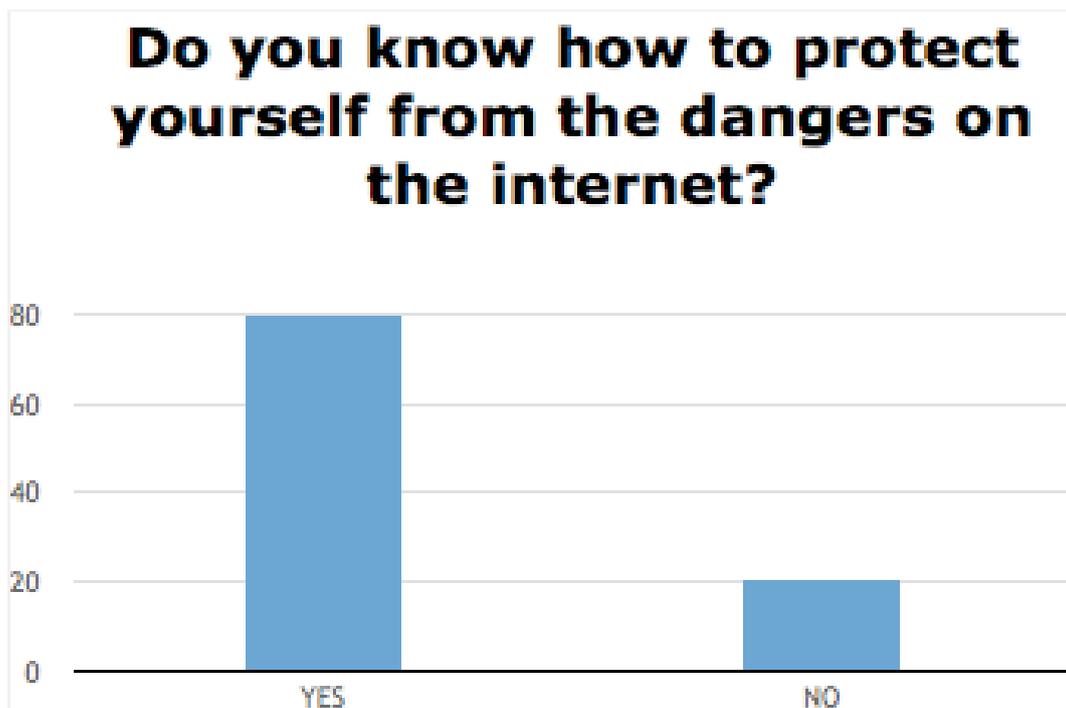


Fig. 10 to 11 shows that boys use computer and internet more than girls.

Fig. 12. Protect yourself?



When being asked the question "Do you know how to protect yourself on the Internet?" most children respond positively. But to the question "How?" they have no set answer.

Children from the very early age should be offered options how to act in different situations online.

Children's responses on being questioned what do they use a computer and internet are: for games, drawing, movies, learning tasks. Answers do not include responses such as "Communicating with friends", "Searching for new friends", which shows that children in this age group become Internet users and it is appropriate to carry out appropriate preventive activities.

The children surveyed say that if something bothered them on the internet, they would tell a teacher or a parent.

Conclusion

In conclusion, the following statements and recommendations for pedagogical practice can be set:

- The activities on building digital and media literacy must be conducted systematically and purposefully, starting from pre-school age.
- Educational institutions (kindergartens, schools) and parents should work together to achieve sustainable results in terms of developing skills.
- Getting parents acquainted with the possibilities to stimulate the cognitive activity of children in digital skills formation and to apply control over children's use of Internet.
- It is necessary to offer measures and activities to familiarize children with the rules for using the Internet, for communicating online and preventing dangerous situations.

When the two most important institutions in a child's life - school and family work together to build digital competency for adolescents, the results will be positive. This is the best way to shape the skills of future generations needed to form a modern society and build a knowledge-based economy.

Brief biography of each author

Assoc. Prof. PhD Krasimira Dimitrova is a professor at the University "Prof. Dr. Asen Zlatarov" Burgas. She is teaching formation of elementary mathematical notions, methodology of teaching mathematics at Primary School and methodology of information technology in kindergartens and

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