CONDITIONS FOR FORMATION AND INCREASE OF DIGITAL LITERACY IN CHILDREN AND STUDENTS OF PRESCHOOL AND PRIMARY SCHOOL AGE

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Abstract

The formation of digital skills in children and young students is especially relevant for pedagogical practice. The subsequent development and formation of digital literacy depends on the successful creation of a digital base. The ability to work with modern information technologies is an integral part of the successful realization of the modern personality.

In this paper, an attempt is made to derive the conditions that are suitable for the formation and increase of digital literacy in children and students of preschool and primary school age. The results of a survey within teachers working in schools (grades 1-4), parents of children in the study group. The positive conditions are presented, but also factors that prevent the creation of a successful environment for the acquisition of digital knowledge and skills are taken into account.

As a result of the study, the main digital skills are derived, which according to the respondents should be formed in the considered age group. Skills and competencies that can be developed in the implementation of specialized activities for the formation of digital literacy are described. Depending on the derived digital skills, technological solutions are offered, with the help of which they can be formed.

In order to form digital literacy, the presence of a digital environment is a must. Depending on the nature of the digital environment - spontaneous or educational, the degree and direction in which adolescents' interest in technology and their application develops is determined.

The role of educational institutions is to organize, assist and guide the activities for the formation of digital skills of children and young students. The existence of a system for the formation of digital skills in children provides a spiral development and upgrade of knowledge and skills. This provides a solid basis for building digital literacy and competence.

The current situation of distant education requires new measurements of digital literacy and for technology use. It is necessary to rethink the functions of each one of the participants in this new educational process – teacher, student, parent.

Keywords: digital literacy, technology, spiral approach, digital environment.

1 INTRODUCTION

1.1 Key competence and Soft Skills

Key competencies are defined as necessary skills that must be acquired by members of society for their successful future realization. Key competence and some of the base skills are a must for realisation, job development, socialisation and active citizenship [1].

Soft skills are the ones which you can build by yourself and are made from the relationships with others. They are individual and social skills. The individual ones are the skill to process the information, to criticise, desire for knowledge and self-improvement, planning and achieving goals. The basic social skills are communication, listening, leading a discussion, working with network (networking), problem solving and taking decisions [2].

Soft skills implement the hard skills, which are a must in some professional areas. For example, soft skills which are a must in the entrepreneurial area are connected with leadership, taking risks, introduce innovations, leading changes. In this case we agree that soft skills previse the success in life by searching reason-consequences relationship between soft skills and individual and professional achievements [3].

1.2 Digital literacy

To summarize digital literacy is the skill of using information and communication technologies for searching, rating, creating information which needs cognitive and tech skills [4].

The skill of working with certain devices and technologies, can not be compared with other digital literacy [5]. The teenagers are surrounded by technologies and they can work with no problem with the new devices. The principle of test-error is the key of finding the right steps to realisation of the exercise.

The specific features of digital skills and digital literacy are described in Table 1 [6]:

Table 1. Digital skills and digital literacy – specifics.

Digital skills	*Digital literacy*
Sending e-mail, text message	The ability of finding the perfect digital channel for communication with friends, parents and teachers.
Using Microsoft Office	The critical judgement for using the proper program for performing the exercise.
Publishing in Twitter and Facebook, uploading videos in Youtube, put a story in Snapchat and publishing a picture in Instagram.	Ability to safely use social networks, identify and differentiate propaganda, cybercrime, harassment, critical attitude to shared information.
Search for information using Google (or other information search engine)	Opportunity to effectively use online search as a research tool - choosing the right search words; evaluation of results based on signs, such as web addresses; tracking information to a reliable source; assessment of the tone, style, audience, attitudes and purpose to determine the accuracy of the information.

Digital literacy is not a specific example, it is changing with the evolution of the technologies.

Its level depends on:

- Practical and technical skills
- Cooperation skills
- Social and cultural skills
- Critical thinking.

1.3 Digital environment and technology

The digital environment, in which modern kids are born and raised, determines their way of life and worldview. The trend worldwide is the desire of the parents to saturate their children whit all kind of new technology in their early ages. In Bulgaria this trend is especially expressed. In educational institutions there is a regulation for how to use technologies and rules for them. But when the children are not in school, often the tablet and the smartphone are this "Nanny", which provides comfort to the parents.

1.4 Current condition and standards

Since the 2018-2019 school year in Bulgaria, "Computer modeling" became mandatory subject for third grade. The learning process of computer modeling in early stages is focused in gathering initial knowledge and skills related to build digital literacy of students by making computer models of familiar objects, processes and doing experiments whit them. The important thing in third grade is assimilating knowledge and skills for proper usage of digital devices, working whit files, creating animated projects using algorithms whit conditions and iterations through visual environment for block programming. The computer models realisation in visual area is preparing with materials from the students' habitat and performing algorithm with materials from the same area – albums with blocks and puzzles, easy to work with robot devices and etc. [7]. The education is conducted from primary teachers, who has the right qualification.

Until this school year in most of the schools, the primary grades have learned IT as selectable class. With the changes that have taken place in the program and educational planning, the numbers of

schools in which IT learning continues, drastically decreased. In other school projects programs is expected to form the necessary digital competence.

2   METHODOLOGY

The education institutions and parents are in charge of the successful formation of digital literacy in teenagers. The education institutions are expected to structure the knowledge and the skills, which students have to acquire in definite age. The parents are the ones, who has to observe for the correct use of the technology from their children, when they are not in the education institution.

The results from questionnaire research made between teachers in primary school, parents opinion about the digital literacy in small kids and the factors, which influence their formation are presented in the current paper. The results from questionnaire research between students from 3rd and 4th grade about the way they use technology every day, are also presented.

3   RESULTS

3.1   Questionnaire with teachers in primary school.

Questionnaire is being held with 21 teachers who teach in primary school from different regions of the country – the town of Burgas, Varna, Provadiya, Dulovo, Kiustendil, Goce Delchev and Karlovo.

Every teacher in the research have their own computer at home, smartphone, internet at home and mobile data. They conducted online education since March.

38% of teachers conducted online lessons, 9,5% of teachers have sent materials online, 52% have practice both of the forms.

The platforms which the teachers use for the online education are Teams, Zoom, Skype, Google Classroom, Viber and Messenger.

To the question "Did you need help with the technique during the online education?" 38% of the teachers have said "Yes". This fact leads to the requirement of periodically information technology increasement of the pedagogical specialists qualification. Teachers must be taught to use at least one platform for online classes while they are still at university.

During the online education is observed that most of the teachers have used more than one device.

This is the reason for the higher percent. Computer is used by 29%, laptop – 71%, tablet-9,5%, smartphone-48% (Fig. 1).
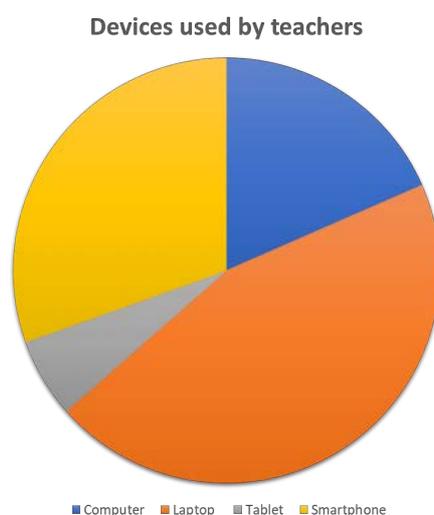
Devices used by teachers

■ Computer ■ Laptop ■ Tablet ■ Smartphone

Figure 1. Devices used by teachers.

To the question "How many lessons do you make in a week?" (conference call), the answers are: 5 times-86%, 4 times-9,5%, 3 times-5%.

The purpose of the following questions is to see how the digital skills during the online education are formed. To the question how do they realize formation of digital skills, the teachers answer – by sharing screen, they send exercise and got realised project, by recording education videos.

A teacher report that there are students with no computer and internet. He has made paper materials for them. This fact reveals a very serious problem, which is not an object of our research, but put some food for thought.

The teachers were asked "Did you give students homework from different subjects, which requires the information technology use, during the online education?". The answer "Yes, in all subjects" is being given from 2 teachers. "No"- 43%, "Math"-33%, Language –19%, IT – 19%, Music –5% (Fig. 2).

Use of IT in various subjects

■ Yes, in all subjects ■ No ■ Math ■ Language ■ IT ■ Music

Figure 2. Did you give students homework from different subjects,
which requires the information technology use, during the online education?

The next question is connected with the parents part of making the homework for the different subjects, which requires information technology use. 43% of the teachers answer that parents help children.

Online platform using leads to the question are small kids prepared and if they know the rules for working with internet and how to take care of them. To the question "Are your students acquainted with the rules for using the internet?" 57% of the teachers have answered positive. Teachers said that they have explained the rules in classes which include IT.

Teachers says that there are difficulties during online education, which are connected with the lack of technical devices in students; lack of internet; teachers have difficulties with working with some of the programs; communication with all of the students; some of the students are not strict; small students are easily distracted; receiving homework all day long; organisation problems, when there are mora than one child in the family; restriction for activities and group exercises.

To the question how do they prefer to teach – attended or online, all of the teachers answered – Attended!

The connection between primary teacher and small student is unique. Teachers share that the students want to spend some time in front of the cameras just to talk, to play games, just to spent some time together. The social contact is main factor for developing soft skills and in this case information technologies were the connection between subjects.

3.2 Questionnaire between students from 3rd and 4th grade

Questionnaire is being held with 29 students at the age of 10-11. All of the students live in families, in which there are different technological devices and connection with internet.

We are going to analyse part of the questions.

To the question "What device did you use during the online education?" the students answer: Laptop-66%, PC-14%, tablet-3,4%, smarthphone-17%.

"Who helped you with the technique during the online education? The students' answers are as follows: Mom-48%, Dad-21%, On my own-38%, Other-10%.

The data shows that mothers spend more time for education during online education.

To the question "Do your parents help you with the homework which require using information technology?" 31% of students have answered with "Yes". This is really low percent. We can guess that students are rarely given difficult homework and they do not have to ask their parents for help. Other possible script is that the children want to show their independence.

The small students declare that they know the rules of working with internet from their teacher. If they fell in a dangerous situation in internet they will ask for help from their teacher ot parent.

3.3 Parents about technologies and children

There are parents who say that their children have become familiar with the use of devices before they reach 1 year (9%) [8].

This fact means that children can work with digital technologies before entering the education institution. Their first impressions are influenced from the family and social area. The result is quite natural, showing that 86% of Bulgarian children use digital devices for games [8].

The data base is contradicted in the following two researches.

The question „How many hours a week does your child use digital technology?" 7 parents answered „permanently", „non-stop", „all day". Some parents said „70 hours", which means 10 hours per day children play on devices [8].

At the same time 56% of the parents said that they are worried about the use of digital devices by their children because not only does it impair their kids' vision but the child becomes obsessed with technology, lazy and does not want to read books because of immobilization. „Because the child becomes nervous, he does not pay attention to things around him when he/she plays with smartphone, for example" [8].

We can make a conclusion that parents expect from the education institution to define the exact competences, which have to be formed in the exact age, to realize the conditions and the environment for their formation, as well as to prepare the children to be responsible for the technologies.

4 CONCLUSIONS

The conclusions we can make from the questionnaire are:

- The teachers who teach at primary schools have good technical skills.
- Policy for digital skills formation is a must for the children out of the class "Computer modeling"
- It is recommended to give the students homework and project exercises, which have to be realised by information technologies.
- It is recommended for the teachers to increase their technique competition skills periodically.
- United activity between kids, parents and teachers is recommended to be made, in which they have to discuss problems with internet and information technologies.

It is necessary to create Screen Time Guidelines for parents from Bulgarian educational and health institutions. The problem of digital literacy of Bulgarian students is important and needs of adequate solutions. This comparative analysis of parents', teachers' and students' answers towards digital competence and its relation to children's lives can contribute to acquiring sustainable knowledge that can be used in teachers' guidebooks, educational policies and recommendations for parents and practitioners [9].

ACKNOWLEDGEMENTS

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