

OPPORTUNITIES FOR INCREASING STUDENT'S DIGITAL LITERACY FROM PRIMARY SCHOOL AGE THROUGH ADDITIONAL FORMS OF EDUCATION

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Abstract

The formation of digital literacy among primary school students is an important problem of the modern society and those involved in this process - educational institutions and parents. Digital literacy is a set of competencies necessary for the successful participation of the individual in the informed society. Digital literacy refers to the availability of knowledge and skills in the use of digital devices, behavior in expression and cooperation in an electronic environment.

Nowadays, children grow up among technology, but they use it mostly for fun and communication, not to organize effective educational activities. This leads to the conclusion that despite the frequent use of technology and electronic devices by children, it does not mean that they are digitally literate. The formation of habits for the use of certain technologies to solve specific problems leads to the construction of digital literacy.

The use of digital tasks and activities in primary school to increase digital literacy must follow successfully created and established activities to expand and upgrade. Building digital literacy is closely linked to the development of digital learning habits. An important factor for the successful formation of digital literacy is to define skills that will help students in the future digital world.

The formation of digital literacy is a complex and long process that has different dimensions over the years. Regulated school hours are insufficient to carry out systematic digital training. Additional forms of training prove to be a successful tool for the formation and improvement of skills for working with digital and programmable devices.

This article presents the results of a survey among teachers working with primary school students on opportunities to work with children to develop digital skills. The additional forms of education used by them are described and good pedagogical practices are derived.

Keywords: digital literacy, technology, additional forms of education, primary school age.

1 INTRODUCTION

The main change that is required in the education of the 21st century is primarily related to the goals of the education and the transition from acquiring encyclopedic knowledge to the formation of problem-solving skills in various areas of life. An important prerequisite is the application of a competency-based approach in the education. A leading emphasis is the development of learning tasks that stimulate critical thinking, teamwork, creativity, entrepreneurship, emotional intelligence, decision-making and other skills important for personal success. The learning material for primary school students is too much. Usually, there is not enough time to cover it in practical terms. This fact leads to a misunderstanding of difficult and abstract knowledge, as well as its rapid forgetting.

This paper attempts to describe additional forms that are used by teachers to form and increase the digital literacy of young students, as part of the general literacy of adolescents. The basis of the change of the educational paradigm is the competence approach.

2 METHODOLOGY

The application of a competence approach in education presupposes the use of interactive methods, modern technologies for education and information technologies. Assessment forms are diverse and enable learners to present their capabilities in a way that is appropriate for them. Through the application of the competence approach, the focus of education changes - from subject-oriented learning to competence-oriented learning.

The aim of the research is to describe appropriate pedagogical methods and approaches that support the formation of digital literacy in students of primary school age. Methodological solutions for application in pedagogical practice are offered.

2.1 Competence approach

The shift of focus in education from teaching knowledge to mastering key competencies and developing problem-solving skills brings to the fore the main features of the competence approach.

Leaving the field of the specific subject presupposes the introduction of a learning context based on universal topics. For example, in Maths classes the knowledge and skills acquired in Bulgarian language classes are applied. Physics education is based on what has already been studied in Maths. For Technology and Entrepreneurship classes what is learned in Man and Nature and in English is actively used, etc. [1].

After 2000, the educational practice of a number of countries began to talk about competence-oriented education as educational reforms and the change of the educational paradigm of the industrial society. [2].

School education begins with an orientation towards provoking thinking and independence, towards the formation of practical skills and towards the development of the personality [3]. "The competence approach in education creates conditions for mastering a set of competencies, providing potential and capabilities for sustainable and effective life in the modern complex socio-political, market and information space" [4].

In a number of sources, the terms competence and competency are used interchangeably. Other sources present their difference, but setting a clear boundary is difficult.

Competence is the concept that characterizes the personality. It describes aspects of perception, understanding, goal-setting and behavior that are behind the consideration of the performance of the work (based on the views, worldview and related professional knowledge, skills, habits).

Competency is a narrower concept related to work (the position). It reveals the scope of the professional activity in which a person is competent and reflects his status in the organization, powers and responsibilities. Competence determines the socio-economic conditions of professional activity and the infrastructure of the workplace [5].

With regard to the educational system, the competence is a pre-set normative requirement for the educational preparation of the learner, and the competence - already mastered competence, acquired personal quality [6].

Competence is the way a person uses all his personal resources (skills, attitudes, knowledge and experience) to properly solve a task in a particular context. Competence is defined as "a set of knowledge and skills that allow the pursuit of a professional activity in accordance with the requirements of production and employment".

Competencies include:

- Theoretical knowledge.
- Practical knowledge: skills and abilities.
- Knowing how to be: attitudes and behavior.

2.2 Competences

M. Armstrong divides competencies into two types - behavioral or "soft" (emotional intelligence, communication, resistance to change, proactivity, teamwork, decision-making skills, achievement orientation, motivation skills, leadership, etc.) and technical or "Hard", which determine the specific professional skills and abilities.

In the literature, new educational concepts can be found in the various classifications - competencies, life skills, key competencies... [7].

The leading role of educational institutions is to build individuals - educated, with formed skills and competencies necessary for their successful implementation in life. Changes in all spheres of public life require a change in the educational paradigm. In addition to the knowledge that is acquired in

school, the competencies that each person must have in order to live fully and be successfully realized are brought to the fore:

- full interaction with the environment;
- communication in different socio-cultural spheres of activity;
- implementation of actions adequate to the situation;
- making independent decisions;
- critical thinking and logic in discovering the strengths and weaknesses of alternative solutions;
- having social receptivity;
- empathy.

Competency-based education begins with the identification of specific competencies or skills. Students are given the opportunity to master individual competencies or skills at their own pace, usually working with a mentor. Learners can develop only certain competencies or skills that they need, or they can combine a whole range of competencies to a full qualification (competence) [8].

The main characteristics of competence-based learning are found in the following features [9]:

- Students progress by demonstrating their achievements - they can spend more time on a subject that is more difficult for them.
- The objectives of the education are specific, measurable, transferable, which allows for planning and striving to achieve them.
- Assessment is aimed at improving education. Students receive feedback on their shortcomings so they can work to overcome them.
- Students receive timely and differentiated support based on their individual learning needs.
- Students actively learn, form, and apply critical thinking and problem-solving skills, along with communication, collaboration, and cultural responsiveness skills to help them work in the ever-changing, diverse workplaces.

The educational system is faced with a number of questions, the answers to which provoke the development of pedagogical models for learning and personal development. As a result of their testing in practice, guidelines should be provided to the pedagogical community - factors for the formation of key competencies, approaches and methods for cognitive activity, overcoming the contradiction of the growing amount of knowledge, skills and competencies and limited opportunities of adolescents.

The implementation of extracurricular forms of education as additional activities provide an opportunity for multifaceted pedagogical interaction. Interest groups and camp schools are considered as such in the article.

2.3 Project-based learning

Opportunity to work on the formation of a number of soft skills are provided by clubs of interests. They are organized outside the school hours. They can be realized in a school, in a community center, in a specialized center.

For the needs of the present research, interest clubs of primary school students are analysed, whose main goal is to form and increase digital culture and literacy.

Many years of personal observation lead to the conclusion that children and students learn the intended knowledge and experience when they are involved in a situation with a certain plot. Children like to create resources to help a certain subject or to contribute to a noble cause.

An appropriate pedagogical solution is project-based education. The main emphasis is on planning activities that are implemented through teamwork. Through teamwork, all social qualities are developed, which are formed by interacting with others in a specific environment. Working on a thematic project in primary school contributes to the development of a number of skills - planning, algorithmic thinking, creativity, desire for self-expression, communication skills and more.

At a certain stage of the work, students find that they do not have enough knowledge and experience to realize their idea. Then they seek help from their teacher. Knowledge is no longer an obligation, and the students themselves need it. What is learned in practical project work is more in-depth and aware.

2.4 Additional activities

The so-called interest clubs are organized for students of primary school age. They are held after the end of compulsory school hours. The clubs have a certain focus. Children who participate in a particular club have an interest in the field.

Of interest for the present study are the interest clubs related to the formation of digital literacy.

A survey was conducted among teachers who run an interest club related to increasing the digital literacy of primary school students. 18 teachers from different districts of the country were interviewed. The study does not claim to be representative.

All surveyed teachers share that the activities in the interest clubs contribute not only to increase the digital literacy of students, but also to the formation of a number of soft skills. Teamwork, concentration, tolerance, knowledge transfer, algorithmic thinking, etc. are listed.

The directions in which digital skills are concentrated are related to skills in word processing, images; creating presentations, animations; block programming; work with programmable devices.

Only one of the teachers indicated that he planned to develop students' presentation skills. It can be concluded that the work in this direction should be intensified. It is essential for children to develop their speech skills and defend their own position at an early school age. In an appropriate environment, children should be provoked to express ideas and the way to implement them.

The programmable devices used are Ozobot, Lego Mindstorms, Bee Bot, Photon.

All surveyed teachers indicate that they carry out the education in the framework of different thematic projects. At the end of the project the students present their work. To a greater extent, the presentation is related to a practical demonstration. The teachers say that they do not require the teams to tell what and how they did something, ie. there is no reflection of the activity.

3 EXAMPLES

We offer several examples of the formation of digital skills in students of primary school age by working on thematic projects in interest clubs.

'Code the Future' Club. It involves 3rd grade students. The main activities are related to projects with Scratch and the Ozobot programmable device. The students are divided into teams (Fig. 1).

Students perform tasks related to their language skills, knowledge of society and nature. The most exciting are thematic tasks related to discovering a secret, hidden treasure or the task of helping someone.



Figure 1. 'Code the Future' Club.

Robotics and Coding Club. It involves 4th grade students. The knowledge that students have is more, as well as the devices they use. The projects are larger. Some of the projects that students have worked on over the past year are "Help for the animals in the jungle", "Delicious World" and others. (Fig. 2). Students consider the task, obtain the necessary information, create sets, assemble and program the Lego Mindstorms robot.

Students are at an age when they are still unable to plan their activities and distribute responsibilities among team members. The teacher has a leading role in setting the tasks in the team. Each student in a team must have a task. The performance of the tasks of all members depends on the performance of the common team task. The teacher seeks to guide more active students to help the lagging behind, not to do everything themselves. The aim is to develop skills for tolerance and mutual assistance.



Figure 2. 'Robotics and Coding' Club.

Around the World Project (fig. 3) for 3rd or 4th grade students. Educational areas - Mathematics, Language, Arts, Music, IT

Activity 1. Continents

The team receives a set of math problems. Each team member has a task. If all the tasks are solved correctly and connected in a certain sequence, a code is obtained. The team has the task of programming their robot to go through the sequence of answers to the tasks. There is a certain letter under each answer. Finding all the letters, the team must arrange a word - the name of one of the continents. In this way it is determined for which continent the team will work.

Activity 2. Model of the continent

From appropriate material, the team members create a model of the continent for which they will work during the project. They find relevant information about which countries are located there, what big rivers and mountains there are. Traditional songs and dances are studied.

Activity 3. Countries

It is distributed by lot among the team members for which country to conduct a survey. The team decides with which program to make the presentation of the countries of their continent - choose between MS Power Point, MS Sway, Prezi. Each student works for one country. Creates up to 5 slides. The information it includes is symbols - flag, coat of arms; capital; famous landmarks; famous people. One of the highlights is "I was interested in ...". In it, the student must tell what impressed him while researching the country.

Activity 4. Presentation

The presentation of the teams is led by a robot Photon. It is placed by the teacher in a certain starting position. The teams know the sequence in which they will perform. They must program the robot to reach their continent.



Figure 3. Around the World Project.

An important condition is that the robot is programmed to go to the next continent only if it hears loud applause. This stimulates the teams to present their work in the best possible way. Students are at an age when they are still unable to plan their activities and distribute responsibilities among team members. The teacher has a leading role in setting the tasks in the team. Each student in a team must have a task. The performance of the tasks of all members depends on the performance of the common team task. The teacher seeks to guide more active students to help the lagging behind, not to do everything themselves. The aim is to develop skills for tolerance and mutual assistance.

4 CONCLUSIONS

When working in extracurricular forms for the formation of key competencies, the following conclusions can be made:

- to work on thematic projects that are important for society;
- the topics for each project should be in accordance with the age characteristics of the students;
- for students of primary school age are suitable short thematic projects, implemented within 5-8 days;
- to use an interdisciplinary approach - in the implementation of the project the activities for learning, sports, creative tasks must be related to the topic of the project;

The main problems that teachers have when working on thematic projects to increase digital literacy of students are expressed in several ways:

- need to consider the topic and the implementation of a certain thematic project;
- the need to create appropriate resources for the implementation of a thematic project;
- lack of a base of ready resources that they can use;
- lack of methodological instructions for conducting teamwork and work on thematic projects.

The conclusions made require efforts to create a base of thematic projects, consistent with the interests and age characteristics of students of primary school age. Teachers to improve their qualification in terms of modern information and pedagogical technologies.

Working on thematic projects using an interdisciplinary approach and teamwork provides an opportunity all the acquired knowledge in the various educational areas and the formed skills for working with information technologies and programmable devices have a direct practical application. The knowledge related to a concrete practical realization remains in the minds of the children. The cognitive activities, carried out in the described way, enable the children to perform the so-called transfer of knowledge, necessary in their life in the future.

ACKNOWLEDGEMENTS

The author is grateful to the research project № DN 05/8 14.12.2016 "Digital competencies and media education in preschool and primary school age", for funding of this paper.

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