SURVEY OF 8-9-YEAR STUDENTS' WORKING SKILLS WITH GRAPHIC EDITOR ON RESEARCH AND CREATIVE PROJECTS

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Abstract

Every generation is shaped by social, political and economic events. Today's generation grows in an environment rich in information and mobile technologies, and social media. Research has shown that new media make teenagers lonely, sad and depressed and has a negative impact on their social skills and even sleep [1]. Since birth, they have been surrounded by mobile technologies, and even in primary school they have access to social networks, and they do not even imagine living without the internet. Today's teenagers spend five to six hours a day using text messaging, chat, games, surfing the web, streaming and video sharing.

An important task of the educational institutions is to use the interest in technology and to teach young students how to implement them into a project or to solve a particular problem. These important skills will prepare the children for successful realization in their lives.

This article presents a survey that was conducted within a national IT competition in Bulgaria. It is attended by pupils from the first to the eighth grades from all over the country – from small and large towns and villages, from small and big schools. The competition takes place throughout the school year in three rounds – online, regional and national. Children from the first 40 places for each of the classes are invited to take part in the national round.

This article presents results of the first and the second-grade students' projects through their work with a graphic editor. Their skills are examined on selected criteria and metrics. 40 projects of the first grade students and 35 projects of the second grade students are analysed.

Keywords: technology, digital skills, graphics, research projects, project task.

1 INTRODUCTION

The realization of the modern generation is unthinkable without digital skills. Digital skills are seen as an element of "basic literacy", along with literacy and numeracy, according to the European Commission in the New Skills Agenda for Europe [2]. Digital skills are the basis for digital literacy, which is defined as the possibility of using digital technologies, communication tools or networks for finding, evaluating, using and creating information [3].

All the different spheres of art allow us to recreate ideas, feelings and experiences. Various arts enrich the general culture of the individual and contribute to the overall development of the child. Working with a graphic editor for elementary school students integrates with basic education and aims to support the development of thinking, imagination, social skills, culture [4].

Work on an educational project in primary school

The work and creation of an educational project to participate in a competition has its own specifics. The work on an educational (study) project can be considered in two aspects:

  – project as a method of cognitive activity;

  – a project as an intellectual / material result of a particular activity.

The first aspect is related to project-based learning (PBL). The second aspect is related to the use of knowledge acquired in the teaching of different subjects, the social experience of the students, the ability to carry out researches and the creative activity. The development of the project is the final activity of the acquired knowledge and the formed skills. The role of the teacher in the preparation of a project that the student presents for evaluation is crucial. He helps and guides the student in choosing the topic and the direction in which the project will develop. The teacher applies a person-centered approach, taking into account the individual abilities of each student, his or her interests and the way of expression.

2   METHODOLOGY

This article presents a survey that was conducted within a national IT competition in Bulgaria – "IT Znayko". It is attended by pupils from the first to the eighth grades from all over the country – from small and large towns and villages, from small and big schools. The competition takes place throughout the school year in three rounds – online, regional and national. Children from the first 40 places for each of the classes are invited to take part in the national round.

This article presents results of the first and the second-grade students' projects through their work with a graphic editor. Their skills are examined on selected criteria and metrics. 40 projects of first grade students and 35 projects of second grade students are analysed.

During competition a few topics are offered to the children from which they choose which one to work on and create their own project. The age peculiarities of the study group suggest a strong influence of the student's teacher – he/she directs the child to the choice of the topic, what information can be included in the project, integration of symbolism, choice of working tools, colour range, etc. Important skills that are intended to be achieved by working on the assigned projects and research tasks are creative and critical thinking.

The analysis of the results will make it possible to trace the current state of the problem, to draw conclusions and recommendations for the pedagogical practice regarding the possibilities for digital literacy at primary school age.

During the 2018-2019 school year, the topics that were given to students in grades 1 and 2 to create a project were divided into two main areas – ADVENTURES and FANTASY. The topics in Adventure were: Adventures with My Pet, Non-villains in the Fairytale World, IT Znayko's Birthday. The IT Znayko hero is a symbol of the competition (Fig. 1). The children know and love him. During the 2018-2019 school year the competition was held for the tenth time. So, the children who participated the national round were invited to celebrate the 10th birthday of IT Znayko. The topic of "IT Znayko's Birthday" is related to the celebration and apart from the need of graphic skills, students have to be creative and very imaginative when creating their project.
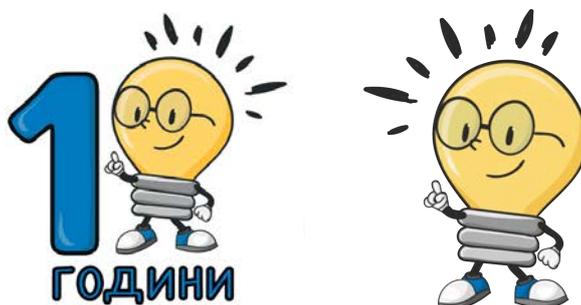

Figure 1. IT Znayko – the symbol of the competition.

The topics in Fantasy are: I have discovered a new planet!, My dream school, The robot I will create, Transport of the future.

The national round is organized in an attractive and entertaining way for all students – with competition tours, team tasks, sports games and many themed entertainment.

The criteria for evaluating the project of students in grades 1 and 2 are aimed at:

- Relevance to the theme
- Composition and design
- Originality of the idea
- Overall impact
- Technical complexity

To determine the level of students' skills for working with the graphic editor – MS Paint, the work of the 1st and 2nd grade students on a graphic project (computer drawing) is used. Certain criteria and number of points have been introduced for pupils of the relevant school age (Table 1).

Table 1. Criteria for assessing graphic skills.

Criterion	First grade max points	Second grade max points
Knows and uses tools from the graphic editor – Paint.	5	5
Uses geometric shapes when creating a computer drawing.	7	7
Write text in Paint.	6	8
Uses keyboard shortcuts and markup to create graphical effects in the project.		yes
Maximum score	30 (100%)	40 (100%)

Two criteria can be added to the ones that form the grade for assessing the graphic skills of students in the first and second grade, which are used to form the grade for evaluating the skills of students above the third grade:

  – Inserts an image into his graphic project - YES / NO

  – Edit image in Paint editor - copy, paste, rotate, move - YES / NO

The addition of the last two criteria is necessary as projects of students in the first and second grade can be with high technical complexity beyond the expected skills (Fig. 2a, Fig. 2b).

Figure 2a. Projects of 1st grade students with high technical complexity.

Figure 2b. Projects of 2nd grade students with high technical complexity.

The students work for a fixed time (90 minutes) under observation. All projects are completed at the same time (Fig. 3).

Figure 3. Terms of project creation.

3 RESULTS

The topics offered to students need to be close to their life and social experience, to provoke them to think and create, to suggest variability in realization.

The results regarding the choice of topics for project development in the 1st and 2nd grade students are analyzed.

An analysis of the skills of working with the graphic editor Paint by selected criteria is presented.

3.1 Choose a theme

The choice of theme in the Adventure direction is presented in Table 2 and Fig. 4.

Table 2. Choosing a theme in the Adventure direction.

Theme	First grade choice number. -% students	Second grade choice number. -% students
Adventures With My Pet	6 – 15%	8 – 22,9%
Strange stories in the fairy world	6 – 15%	7 – 20%
IT Znayko's birthday	5 – 12,5%	4 – 11,4%
general - Adventure	17 – 42,5%	19 – 54,3%

The choice of topics in the Fantasy area is presented in Table 3 and Fig. 5.

The theme "The Robot I Will Create" was not recreated in the students' graphic projects, but the robot appeared in almost all the drawings on "I discovered a new planet!", "Transport of the future". The robot figure is also present in some of the projects on other topics.

None of the second-graders told us what kind of school they dream to study. The lack of projects on this topic can be interpreted differently - students like the school they are studying and do not want change or the other topics provoked their fantasy to a greater extent.

3.2 Analysis of the children's graphic skills with the program MS Paint

3.2.1 Knows and uses Paint Editor tools

Students from first and second grade should be familiar with basic tools for working with a MS Paint graphic editor (bucket, rubber, magnifier, brushes). For second grade, work with a pipette and palette is added.

The following results for the first grade were obtained from the studied projects:

All the children used the bucket tools and the brushes.

Some of the kids used the eraser and the other used the Undo command.

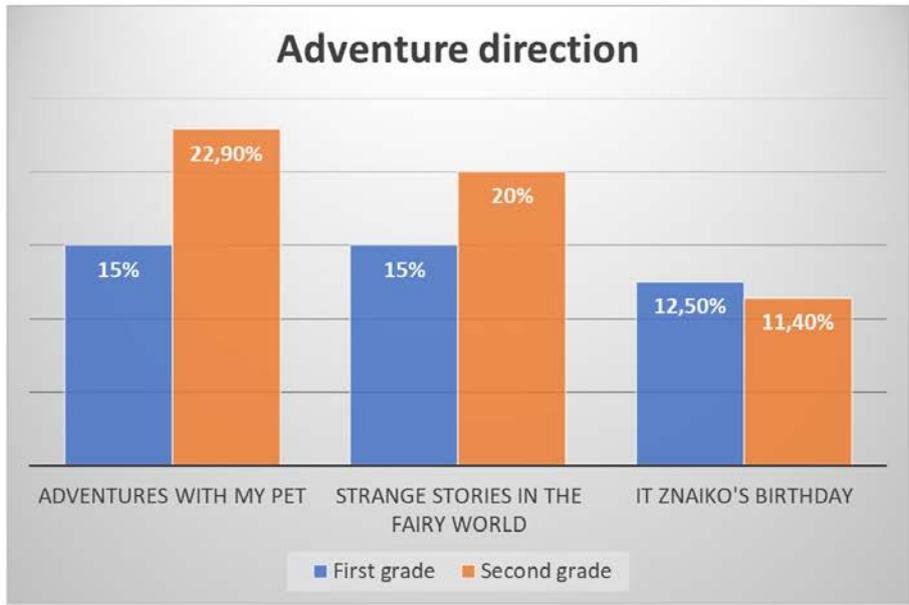Magnifier was used by 7.5% of the students in the first grade.

Figure 4. Choosing a theme in the Adventure direction.

The results are similar for students in 2nd grade. Bucket and brush tools were used by all students. Magnifier was used by 11.4% of the students. In many places where the rubber has been used for correction, there are contour violations. This leads to the assumption that with the mistake made, young students are better off using the Undo command.

Table 3. Choosing a theme in the Fantasy direction.

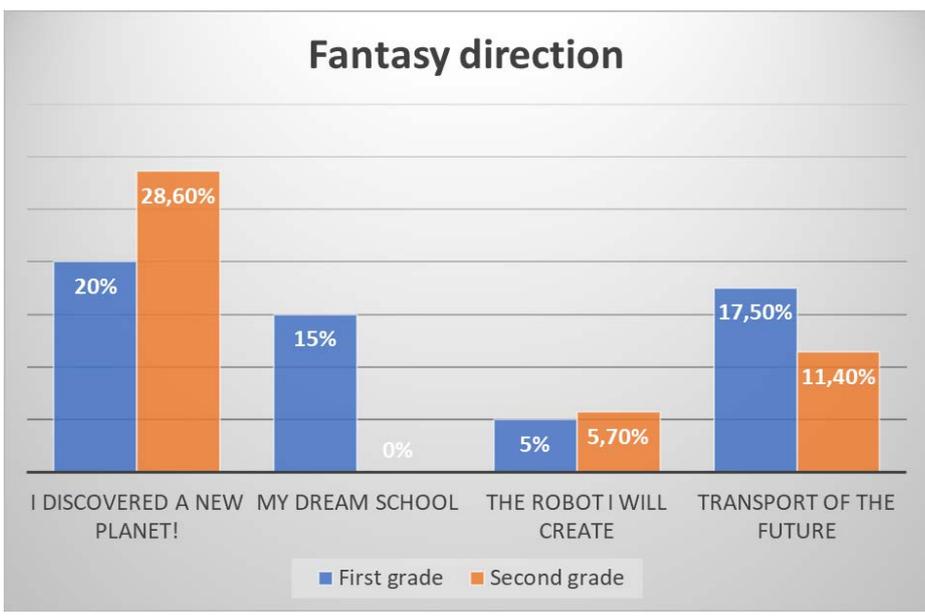| Theme	First grade choice number. -% students	Second grade choice number. -% students
I discovered a new planet!	8 – 20%	10 – 28,6%
My dream school	6 – 15%	0 – 0%
The robot I will create	2 – 5%	2 – 5,7%
Transport of the future	7 – 17,5	4 – 11,4%
general – Fantasy	23 – 57,5	16 – 45,7%

Figure 5. Choosing a theme in the Fantasy direction.

3.2.2 Uses geometric shapes when creating a computer drawing

The geometric shapes are present in all students' designs. The most used are a circle and a rectangle. A positive trend has been observed in some projects that several forms have been used to create a single object or a geometric figure has been used as a base (Fig. 6).

Figure 6. Using Geometric Shapes – First grade project.

3.2.3 Write text in the Paint editor

62.5% of the students has written a text. In the first grade, students are expected to write word-level text. 47.5% of the students typed more than one word, ie. they used an interval. One child drew text using brushes. 17.5% of the students entered the "?" Or "!" Sign, which is a skill of higher technical complexity.

The results are similar for students in 2nd grade. 65.7% of the students have included text in their drawings. 54.3% of the students typed more than one word, ie. they used an interval. One child drew text using brushes. 28.6% of the students typed "?", "!" Or quotes, which is a skill of higher technical complexity.

3.2.4 Uses keyboard shortcuts and markup to create graphical effects in the project

1st grade students are not expected to have skills for using keyboard shortcuts and marking to create graphic effects in the project. The analyzed projects show that effects were created by 22.5% of the students.

Only 5.7% of 2nd grade students applied graphic effects.

3.2.5 Additional skills

The students from 1st grade partially applied additional skills. There isn't any graphic project with embedded images. Regarding image editing in Paint, the following values are available - copy, paste, move - 30%, and object rotation - 5% of students.

The results of the 2nd grade students are as follows:

- inserting an image into a graphic project - 8.6%;
- Image editing in Paint - copy, paste, move - 45.7%;
- Editing an image in a Paint graphic editor - Rotating an object - 11.4% of students.

3.3 Evaluation of projects created with Paint

The originality of the idea and the overall impact of the project influence its overall evaluation.

Often the pursuit of technical complexity and the actual implementation of the project lead to a deterioration of the composition and design of the objects and colors.

There are projects where the idea is extremely original - there is enough technical complexity, but the composition, precision of work, color solution lead to lower quality of the project. For example, the idea in the project "The transport of the future" of a second grade student is original - the action is developed in 2059. They talk to their grandparents and grandchildren while traveling in a modern

vehicle. They are going to the IT Znayko competition. The grandson says they have now arrived in 10 minutes. And the grandfather replies that he arrived in two and a half hours for his tenth birthday. The competition is scheduled for 2019, and the Grandpa is the current runner-up in second grade. In the mind of a child, 40 years are a very long period... The project can conclude that the student knows the basic tools of Paint, can use them, but the basic requirements for working with text, color, etc. are not met, which reduces the quality of the project (Fig. 7).

With this example it can be concluded that in addition to purely technical knowledge and skills, it is necessary to present good practices to the students, to create a sense of the beautiful and the aesthetic.

Figure 7. Project „Transport of the Future" – second grade.

4 CONCLUSIONS

Creating projects with the graphic editor Paint by students from first and second grade gives them the opportunity to set up research and creative assignments. The students work with interest. They are learning to transfer knowledge. Their curiosity, creativity and desire to acquire new knowledge are provoked.

After analyzing the projects under consideration, it can be concluded that systematic and focused work on the development of graphic skills in young students can lead to excellent results that far exceed the teaching standards.

The aesthetic design of the project contributes to the overall development of the child's personality and the formation of skills for composition and design, color perception, the development of spatial ideas. Working on a thematic graphic project can accomplish a number of educational tasks and social competences.

ACKNOWLEDGEMENTS

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