

Multimedia application in teaching computer skills

Ingrid Nagyova, *ingrid.nagyova@osu.cz*

Dept. of Information and Communication Technology, Ostrava University of Ostrava

Jana Hruskova, *L05851@student.osu.cz*

Dept. of Information and Communication Technology, Ostrava University of Ostrava

Abstract

One of the essential principles of PC working are the algorithms, which are also the basis of the main idea of a computer. Therefore those should be a part of every kind of PC working-learning – of course in a hidden, spontaneous way. And it is not important whether the students master the basics of algorithms through the work with a text editor, internet or multimedia.

The Imagine Logo environment enables working with multimedia – with pictures, sounds, melodies and videos. The particular multimedia elements become objects which can be changed and set up, moved, run, stopped etc. using various methods. Within creative playing with them various multimedia applications can be created. We will try to demonstrate the way it is possible to use this playing and multimedia applications creation to introduce the basics of making project and algorithms creation or PC working to the students.

We start with visual applications creation – setting up turtle parameters, animations and making the turtle move. Next we add a sound and we try to synchronize it with a picture. Then it's the work with video, witch is integration into the general conception of a created application that follows. In the end we create a multimedia work on the basis of a nursery rhyme.

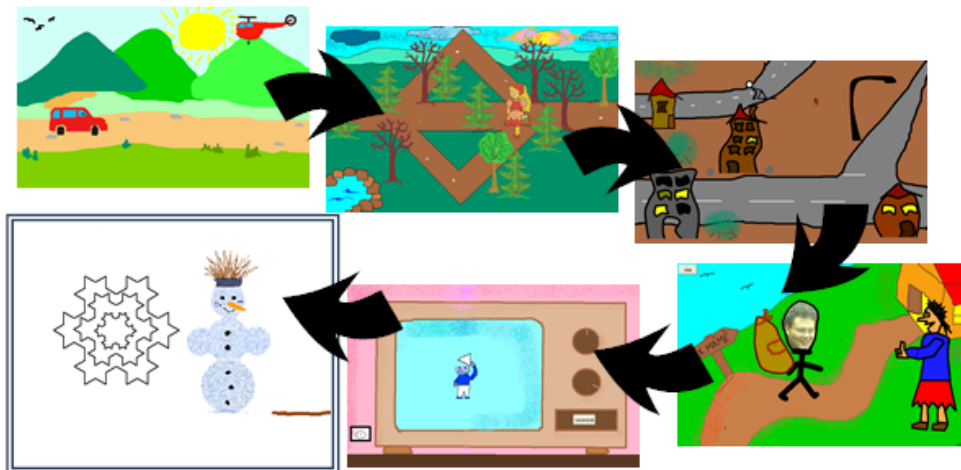


Figure 1. Scheme of multimedia applications creation

The created multimedia outputs can be afterwards used as means of the information and communication technologies integration into the process of non-information subjects' education. We will show you a way of using the multimedia application in religion education and introduce the set of the biblical stories explaining the individual symbols we meet commonly in religion.

Keywords

Algorithm development, ICT, multimedia, Imagine Logo

Introduction

We live in an information society and changes, which are brought into society life by information and communication technologies (ICT) are of such an importance that they influence all spheres of our lives, including education. The goal of ICT integration into education, though, is not only to teach pupils how to work with a computer, but to change the teaching methods through education informatization according to the requirements of the society development and scientific and technical development.

Searching for ways and possibilities of the computer utilization in the educational process occupies many both educators and ICT specialists. The whole range of concepts are being developed and enforced. They come from different theories and styles of teaching and offer possible solutions. These concepts further influence not only incipient educational programs but also the way of their utilization in the educational process.

As well as during solving most of the problems, it shows most suitable to try to get to the point of a taught topic or a process and understand its inner structure. So if we are looking for ways and possibilities in teaching basics of the work with a computer, it is necessary to look for the core and principles which the idea of a computer comes from and the work with a computer is based on. The effect of this searching will enable us to look for images of these ideas and principles, suitable pre-concepts (Papert, 1980). These will further lead students to the construction of needed knowledge, in our case to gaining knowledge and skills of working with a computer.

The question is: What is the core of a computer and what principles is the idea of a computer based on? What skills and knowledge make the basis of the work with a computer?

If we look to the history when looking for these answers, we realize, that originally it was inevitable to know the computer language (computer code, assembler, later it was higher programming languages - Basic, Pascal and the like), how to define a sequence of commands in it, principles of an algorithm creation and how to program to work with a computer.

These days the knowledge of programming is not required for the work with a computer anymore. Nevertheless, during more detailed examination of this work, we realize, that we are still defining a sequence of activities for a computer, deciding about their mutual succession and repetition. Everyone who does any work on a computer uses the basis of algorithm development as well. The language for this communication isn't programming language anymore, but direct operations and relations between them.

Algorithm development is one of the basic principles necessary to manage the work with a computer. But still it is not important whether we master the algorithm development basics through work with a text editor or for example work with multimedia. But it is obvious that work with multimedia is the one more interesting and more attractive for pupils and students. Below we mention a way and a process of teaching the students create multimedia applications in Imagine Logo environment – we went from the book (Blaho, Kalas 2004) – and familiarizing them with foundations of design and algorithms creation during these activities.

Process of teaching

1st Stage: Animation and turtle parameters

We start with a creation of a simple animation of a selected mean of transport by spinning its wheels in the bitmap editor Logo Motion. Students draw the background of the traffic situation (countryside with a road) afterwards and they place their mean of transport in it (turtle). By setting the parameters of the turtle (shape, direction, drawing pen and the like) and putting it in motion (so far only rectilinear motion) the first simple animation is created.

For this application not to lack an idea, the mean of transport changes during its ride into a flying object (see picture - transformation of the pram into a fish).

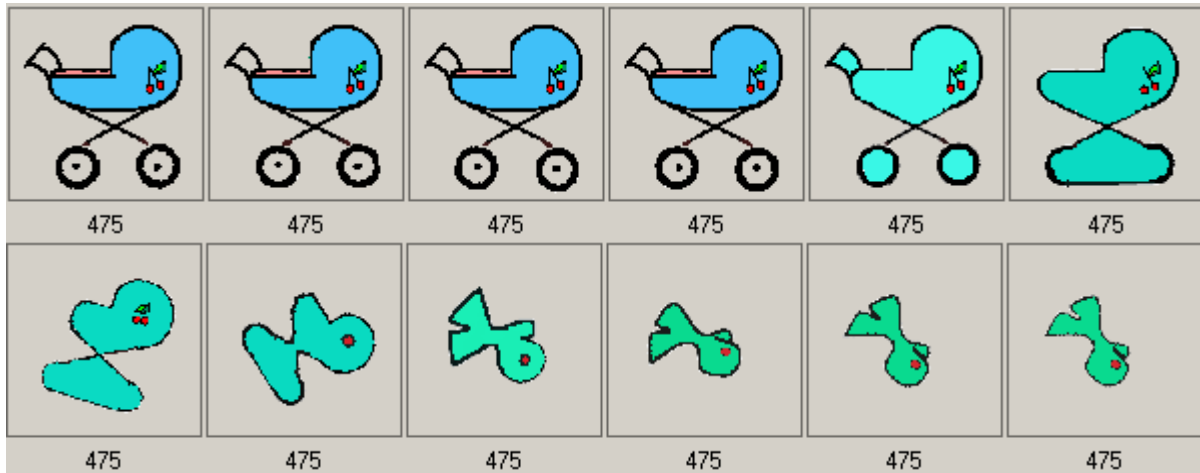


Figure 2. Animation – transformation of the pram into a fish

2nd Stage: Turtle movement and overlapping

The basic feature of a turtle in Imagine Logo environment is a possibility of its movement. Turtles can move forward, backward, turn left and right. Turtles can be “disguised” into the Fairy Amálka, who, she is struggling through the thick forest makes quite complicated movements on the screen: turns left and right, goes round obstacles etc. By adding the requirement of the right movement of the Fairy among trees (turtles) a project with a goal to solve not only the movement but also the overlapping (setting the level of illustration) is created – see figure nr. 2.

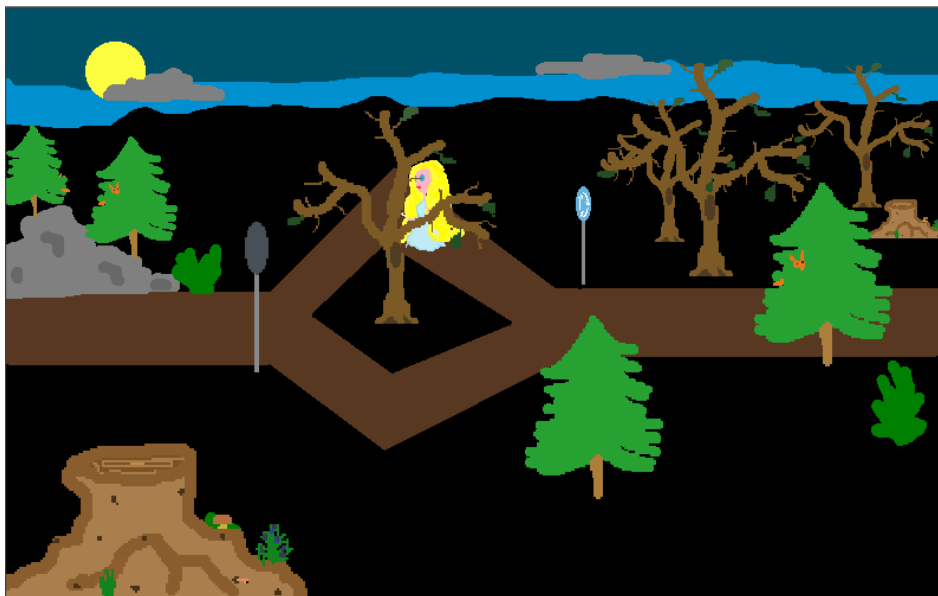


Figure 3. Fairy Amálka in a dark forest

3rd Stage: Working with sound, picture and sound synchronization

Sound tracking of created animations and moving pictures is taught by synchronization of changes of the turtle shape (the turtle changes its shape in numbers) and the corresponding sound recording. The main principle is cutting the recorded sound into pieces, which correspond to the individual pictures (phases of the animation). The final creation will be developed as a result of setting time delays between the individual pictures and the corresponding sounds.



Figure 4. Pictures of numbers completed by sound recordings

For sound recording, its modifications and editing we use Audacity sound editor, which is freely available and easily controlled. Imagine Logo environment enables to play created sound files in WAV format.

4th Stage: Creation of a multimedia work on the basis of a nursery rhyme

Previous teaching leads to a creation of a multimedia application on the basis of nursery rhyme. The students select a nursery rhyme, create necessary animated pictures and record the sound of the selected nursery rhyme. They cut the sound according to the verses. Then they create background for the nursery rhyme and gradually enter individual animated pictures as turtles and define their movements. All of these have to be perfectly timed and set.

By defining and setting the activities of the individual turtles, setting and changing their parameters in a certain time sequence, students get to know the project and creation of the algorithms in a natural way. In such a way they learn about the basic principles of a computer and learn how to work with it.

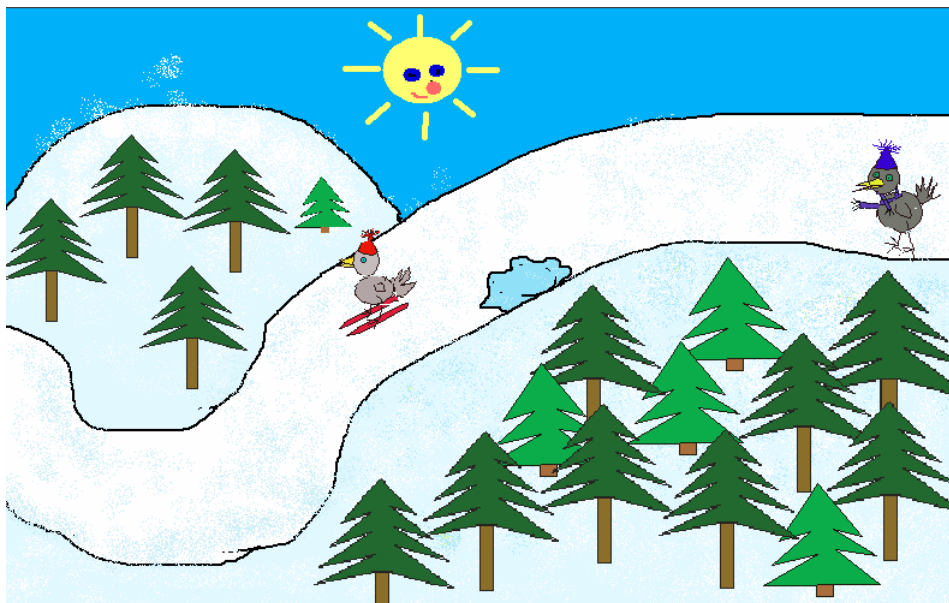


Figure 5. The multimedia application on the basis of a nursery rhyme

Application in teaching

The students can use the obtained knowledge and skills for the design and the creation of multimedia applications useful directly in children education within their work experience and other school activities. The created pieces can be used for the motivation of children and during the relaxation part of the class (especially with younger children). They can also help to start a discussion and make the class work more interesting.

The multimedia pieces of the Biblical stories set made in Imagine Logo helped in the religion education. The individual stories explain the symbols we commonly meet not only in religion, but also in everyday life – see the table.

Symbol	Story
Light	Saul's conversion
Goblet	The legend of the goblet
Water	Conversation at the well
Faith	Jób
Bread	Feeding
Lamb	The only son sacrifice
Shepherd	The story of David
Hope	The meaning of life
Bible	About dwarfs

Table 1: The list of symbols and corresponding biblical stories

Each of the ten parts of the set has the same structure:

- a short introduction of the problem – a short fragment of the Bible or a short thought.
- the particular story according to the symbol. The symbol either takes a part in the story or is described indirectly. To increase the motivation and concern of the student and for his better imagination and ability to bear the thoughts the indirect explanation of the symbol was mostly used. For example: "With hope it is like when..."



Figure 6. The David and Goliath fight

- after the end of the story the test questions are displayed to stimulate a discussion and help the student remember the topic (symbol).

The biblical stories set helped the religion education at the family church service for the children of the early pupilage. In the future we are planning to include it in the first stage of basic schools class work.

Conclusion

It stands to reason the programming makes possible to create a new things. By means of the multimedia applications creation we try to show that programming may be creative and enjoyable playing, that may be to promote up to an art. Such work is able to be source of instruction, but also can bring pleasure and gladness.

Multimedia application examples in Czech language can be found in the web address <http://www1.osu.cz/home/inft1/index.htm>.

References

- Blaho, A. and Kalas, I. (2004) *Imagine Logo Primary Workbook*. Logotron, Cambridge
- Papert, S. (1980) *Mindstorms: Children, Computers and Powerful ideas*. Basic Book. Inc. New York