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Educational application of Logomocja-Imagine in Master and Licentiate thesis at Nicolas Copernicus University in Toruń

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Abstract

From the proposed standards of educating Polish teachers in the subject of Information Technology and Computer Science we can infer an important principle: teachers are capable of creating their own software, including educational internet programs which they can use in their lessons. Software created by the teacher himself is most adequate for him didactical-wise. On the other hand there has been created a programming environment Imagine and its Polish version Logomocja - Imagine, which has been listed on the register of didactical appliances recommended for school use, intended for general education, teaching Computer Studies and Information Technology. There is a necessity of educating students capable of teaching how to create software utilising this tool. It is not only about teaching Imagine on school lessons but about its much wider application in creating didactical software, in pedagogical diagnosis and therapy, logopedics or dyslexia. Our students of licentiate and full courses "Information Technology in Education" are being prepared, among others, for these purposes. Master and licentiate thesis are written about utilising Logomocja-Imagine (LI) in preparatory education, using LI in creating educational software for primary and grammar schools, using LI in pedagogical diagnosis and therapy.

Keywords

Imagine, Logomocja – Imagine, pedagogical diagnosis and therapy, logopedis, dyslexia

1. Educational application

In the proposed standards of educating Polish teachers in the subject of Information Technology and Computer Science prepared by the Computer and Media Science Council we can find that: "Each teacher should be prepared to use Information Technology in his own work and in his work with students. The standard of such preparation covers:

- **using IT as a didactical medium adequately to the taught subject and to the stage of education - planning and creating educational environment, evaluation of students' benefits and achievements."**

From the statement above, we can infer an important principle: teachers are capable of creating their own software, including educational internet programs which they can use in their lessons.

Software created by the teacher himself is most adequate for him didactical-wise.

On the other hand there is a document signed by the Minister of National Education stating that the program Logomocja - the Polish edition of Imagine, has been listed on the register of didactical appliances recommended for school use, intended for general education, teaching Computer Studies and Information Technology.

There is a necessity of educating students capable of teaching how to create software utilising this tool. It is not only about teaching Imagine on school lessons but about its much wider application in creating didactical software, in pedagogical diagnosis and therapy, especially for logopedics, dyslexia or internet tests of school completion. Our students of licentiate and full courses "Information Technology in Education" at the UMK in Toruń are being prepared, among others, for these purposes.

Master and licentiate thesis are written concerning wide application of Imagine and Logomocja - Imagine in education.

The first thesis was about using Logo Komeniusz, graphics software SnapGrafx and Imagine for teaching algorithmics in school. The thesis employed Imagine in its original version. Some thesis were then written, partially modelled on projects from the Logotron server, such as weather forecasting in Poland, using the method of infinite piles of animated clip - arts (turtles).

This program presented in the form of an educational internet program (EPI) is situated on the www.scholaris.pl server. Below are two boards from this project.

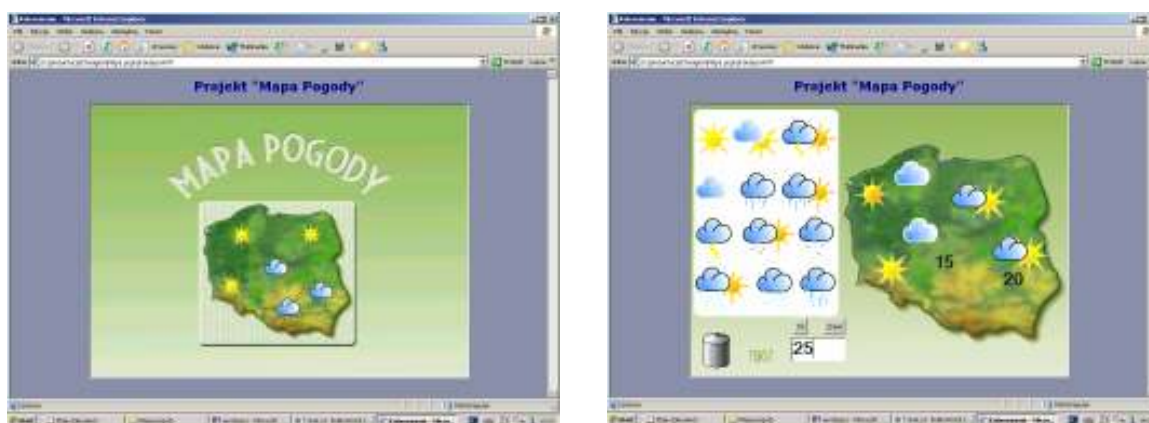


Figure 1. Screen throws EPI „Weather forecasting in Poland”

Another project of this thesis is an EPI which can be used in primary school teaching. The concept of this thesis is used in many integrated teaching course books for correct spelling or counting, which use colouring methods. This project is called "Colouring". It consists of colouring a picture which has been divided into pieces. Each piece contains an arithmetic task. By clicking on one of the pieces we choose the task we want to solve.

The next step is choosing one of 12 "paints", on which numbers have been placed and which are answers to the chosen tasks. If our choice, hence, our answer is correct, the given part of

the picture is coloured in. If not, we can hear an error tone notifying us of the mistake we have made.

In order to create this program a student must first of all prepare in the graphic editor: a picture which is to be coloured and a “set of paints”, so that each colour corresponds with one picture. The picture has to be painted in two versions: black and white one with the marked tasks, and the coloured one. The next step is cutting the completed pictures into pieces.

Each part of our picture, in our example it is a parrot, is a separate turtle, which is placed in the correct position, so that all of them together complete one piece. The two pictures are arranged in the following way: the coloured one on the bottom and on top of it: the black and white one.

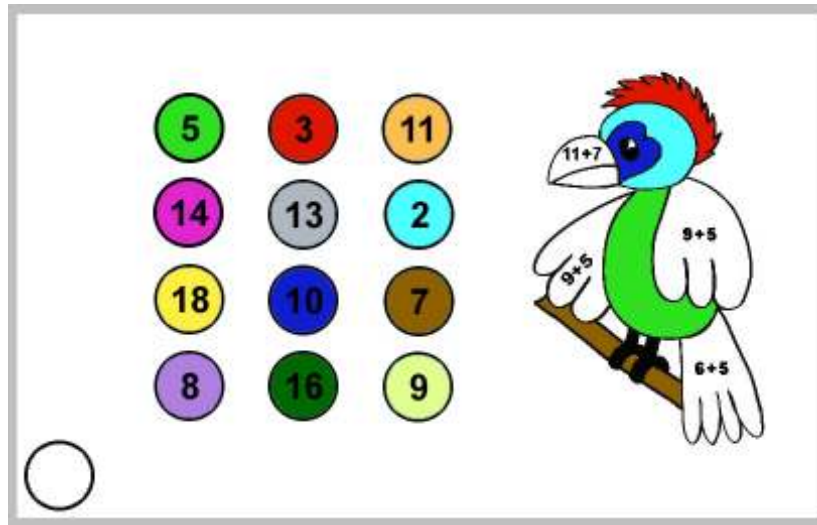


Figure 2. Project „Colouring”

Another step is to assign an action to each part of the picture (turtle), which should be performed after clicking on it with a mouse. In this case it is the determination of the value of the global variable “dzialanie”:

```
make "dzialanie 11
```

This value is the correct solution to the arithmetical task written on our turtle (here: it is the tail). Next, a procedure should be created for each of our “paints”, which shall verify if the correct choice has been made.

```
to klik
  test :dzialanie = 11
  iftrue [ask "ogon_cb[ht] ask "ogon_k[st]]
  iffalse [playwave "buzz.wav]
end
```

If the choice is correct, the black and white turtle is hidden and the coloured one becomes visible. If the choice is wrong, an error tone is played notifying us of the mistake. The last action is creating a “rubber” wiping our picture, that is a key, which after being pressed causes covering up of all the coloured parts of the picture and uncovering of the black and white ones. It also zeroes the value of the variable “dzialanie”:

```

to ponownie
  ask "brzu_cb[st]
  ask "brzu_k[ht]
  ask "czub_cb[st]
  .....
  ask "ogon_cb[st]
  ask "ogon_k[ht]
  ask "pskrz_cb[st]
  ask "pskrz_k[ht]
  make "dzialanie 0
end

```

In continuation the principles of the thesis and of the software of the following programs have been described. The first one is the “Big chase”. It is based on a well - known game called “hungry hedgehogs”. It is about two players solving certain tasks and a correct answer makes the hedgehogs move towards the finish line where a prize waits for them. In the given example, the hedgehogs have been replaced with two chasing dogs.

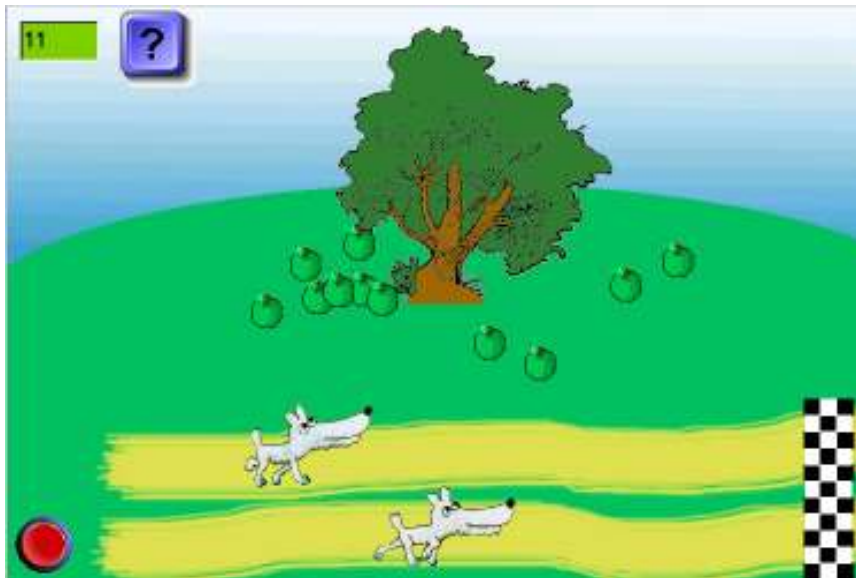


Figure 4. Project „Big chase” The player by pressing the red key sets off the drawing procedure of the amount of apples which appear on the screen.

Next he enters this amount into the window situated on the top of the screen and presses the key with the question mark.

If this amount is correct and adequate signal is played and the player’s dog moves forward. If not, a signal is played notifying of the mistake and the dog remains in his position.

The winner is the person whose dog comes first at the finish line.

This shall be shown on the illustration which shall appear at that moment.



Figure 5. The first and final board of project „Big chase”.

We start this project with setting the scenery in which it shall take place. We create the background and decide on the shape of our characters, which means we create turtles in designed by us shapes, e.g. dogs. Next, in our project we place a key initiating the drawing of the apples procedure. To the activity which corresponds with pressing of this key we assign an appropriate procedure:

```

to nowa
  text1'setEditing 1
  randomize
  new "Turtle [name jabco shape jabco pen pu]
  pu
  let "ile (random 15)+1
  repeat :ile [ask "jabco [setxy (random 400)-200 (random 140)- 70] ask
"jabco [stamp] playWave "bong.wav wait 200]
    make "jabca :ile
  eraseObject "jabco
  make "licznik :licznik + 1
end

```

It activates the edition of the text area, where we write in the amount of the apples. Here a new apple-shaped turtle is created. After determining their number, the apples are displayed on the screen, with the application of the *stamp* function, and an appropriate signal is played at the same time.

The next step is assigning to the global variable “*jabca*” the drawn number of apples and increasing the variable “*licznik*” by one. This variable states which player is taking part in the game at the given moment. If it is even - it is player number one, if it is odd - player number

two. Our next activity is creating a text area, where the player shall write in the amount of the counted apples. We create it with the appropriate key on the toolbar. The last thing is to create a key which by being pressed will set off the procedure verifying whether the player has put a correct number in the text area. This procedure shall also be responsible for the movement of our turtle. Here is the code for this procedure:

```
to pisz
  test mod :licznik 2 = 0
  ifTrue [ifelse text1'value = :jabca [ask "pies1 [setAnimation "true]
    playWave "cheer.wav ask "pies1 [repeat 60 [fd 1 wait 50]] ask "pies1
    [setAnimation "false]] [playWave "buzz.wav]]
  ifFalse [ifelse text1'value = :jabca [ask "pies2 [setAnimation "true]
    playWave "cheer.wav ask "pies2 [repeat 60 [fd 1 wait 50]] ask "pies2
    [setAnimation "false]] [playWave "buzz.wav]]
  ask "pies1 [let "iks1 xcor]
  ask "pies2 [let "iks2 xcor]
  setBgPicture "tlo.gif
  ask "pies1 [setxcor :iks1]
  ask "pies2 [setxcor :iks2]
  text1'setValue "
  if :iks1 = 320 [let "iks1 -280 let "iks2 -280 ask "pies1 [setxcor :iks1]
    ask "pies2 [setxcor :iks2] page2]
  if :iks2 = 320 [let "iks2 -280 let "iks1 -280 ask "pies2 [setxcor :iks2]
    ask "pies1 [setxcor :iks1] page2]
end
```

It's first part is responsible for assessing which player is giving the answer at the given moment. Next the correctness of the answer is checked. If the answer is correct, a signal is played and the turtle moves forward. Otherwise an error tone notifies us of the mistake. The next part of the procedure is assigning to the variable "iks1" and "iks2" the positions of the turtles which next are compared with the position of the finish line. If both of the lines coincide, the game is finished and the final illustration is displayed. If not, the game continues.

The other thesis concern the Logomocja - Imagine software. One of them concerns creating the whole service consisting of internet educational programs (EPI) used for aiding teaching of various subjects in grammar schools. The address of this service is <http://mariusz.bukowski.w.interia.pl>

The student who wrote a licentiate thesis on "Internet educational programs based on Logomocja - Imagine. An internet site for primary and grammar schools", has created original projects for teaching mathematics, chemistry (2 projects), biology and polish.

Below, are the screen throws of the individual EPI.

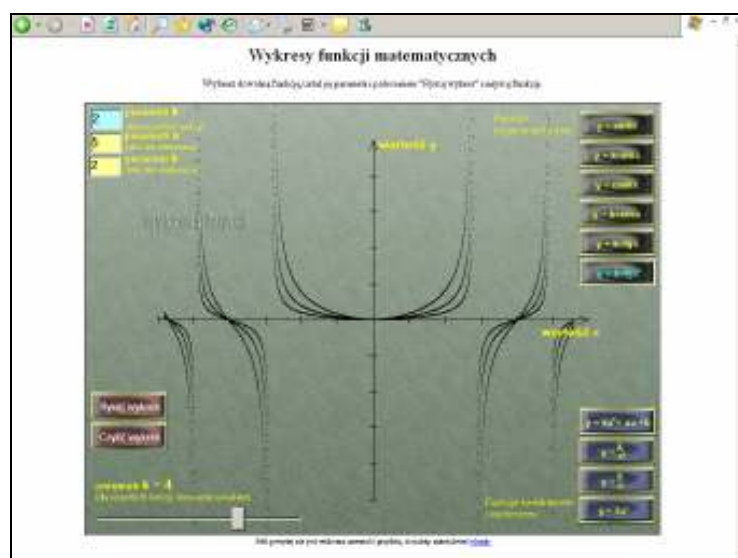


Figure 6. EPI for preparing charts of mathematical functions.

The pictures are screen throws from the server to demonstrate that we have to do with the EPI.

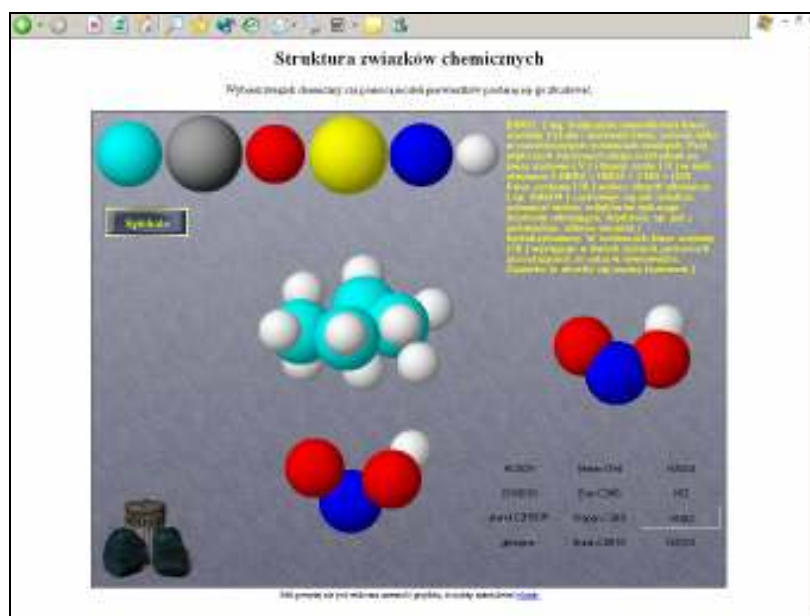


Figure 7. Models of chemical compounds

The project which has been shown above is used for constructing models of various chemical compounds, displayed in the form of keys on the right side of the screen. The method of infinite piles of some basic chemical molecules - turtles has been used.



Figure 8. Spilling dictation

This is a very interesting program - a dictation in Polish. After clicking on the question marks next to the word, in the text area on the right side various versions of the word (correct and incorrect) are shown, which should be written into the given space. Having finished the task, a student can check the number of the mistakes and the mark he has been given. From the programmer point of view this is a very easy program, but the concept of a dictation on the Internet is worthy of notice.



Figure 9. EPI for biology

This program is designed most of all for fun, but by fitting together the jigsaw puzzles the student can learn how exactly looks a butterfly larva.

A separate group of both master and licentiate thesis are thesis written for pedagogical diagnosis and therapy. One of them is a licentiate thesis about software aiding children logopedic therapy, based on Logomocja - Imagine, but I shall dedicate a separate lecture to that subject. There are thesis about dyslexia basing mainly on the facility of moving the objects on the pages and the identification of their position, that is, whether the object has been moved into the correct position and a sound reaction, adding up and assessment of the correct actions. Below, are two screen-throws of a software which is a section of a master thesis which refers to this subject.

The sections above refer to accurate identification (drawing into the correct position) of the first letter of the word or title of the picture.

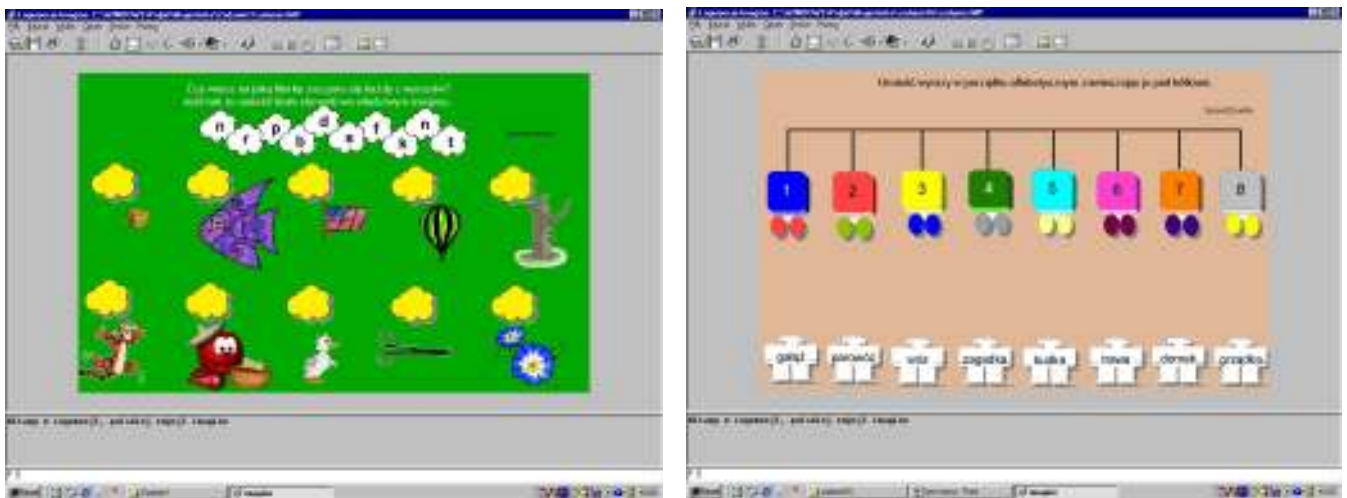


Figure 10. Section of the software for dyslexia concerning

It is quite obvious that the LI system is exceptionally suitable for creating diverse software for primary education. We had a master thesis about that as well. Below, I present its interface and a couple of screen throws from individual programs. The program codes of these programs haven't been presented in this lecture, but of course they are known to the author and can be presented at the conference at any time.

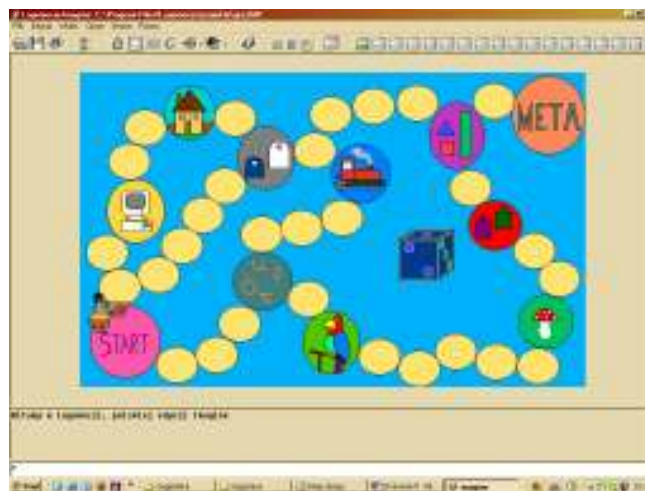


Figure 11. Interface software for primary education



Figure 12. Screen throws from individual programs.

Master and licentiate thesis written under the supervision of the author include a computer section, which consists of an appropriate software consisting of tens of LI projects, which mostly are presented in a form of Internet educational programs. As it has been shown above, they make reference to the application of the LI in early education, various ways of using LI in education, using LI for creating educational software for primary schools, utilising LI for pedagogical diagnosis and therapy. Therefore it was necessary to compose a set of tens of programmatic methods enabling the creation of software with such a wide span of application. To these methods and to their presentation I would like to dedicate the lecture on the application of LI in logopedics, since it is in this service where the capacity of didactical software has been shown.

I believe that even this short presentation has shown that we can call Imagine or Logomocja - Imagine a new and very attractive educational tool which should be present in each school.

References

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