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How things work in Java applets and flash animations?

Introduction

It is necessary to remind that in all fast-developing scientific branches (such as information technologies) a great deal of dynamics is observed also in their terminology and translation. New and new terms are continuously being coined and introduced or the content of some already existing terms is being changed, stabilized or made more precise. Due to the dynamics of computer terminology the following definition of an applet taken from Wikipedia is only one of several possible definitions [http://en.wikipedia.org/wiki/Main_Page].

This long definition requires to be appended by another short description which characterizes a Java applet from the didactics point of view. In our view an applet is a „small" special monofunctional application program used for example for interactive animations or calculations made by a client himself without the need of cooperation with a server. Being applied in the pedagogical process a Java applet enables a teacher to create texts with simulations. Thus, it becomes a tool for creating interactive teaching materials.

1. Set of selected applets designed for thematic teaching in natural and technical subjects

On the contrary, the visualisation by means of a computer model may be improved by a practical and real attribute that is contained in a textbook or a model construction kit but not in an computer model.

The created collection of computer models was called : The world of natural and technical sciences (of younger pupils) in computer models (educational models designed for teaching natural sciences, technical work and essentials of ecological education at the first level of primary schools). In order to strengthen the didactic application of the computer model the names of the individual computer models begin with the words. The individual applets of the packet start with the following words: How does it work/function? or Do you know why/Do you know how…? How does the human body work? Do you know your digestive system? Do you know how it works? Do you know how your heart works? Do you know how the respiratory and circulatory systems work? Do you know how the musculoskeletal system works? Do you know how the nervous system works? Do you know how the endocrine system works? What do you know about human reproduction? How does the reflex arch work? How does the sense

of sight work? How does the sense of smell work? How does the sense of touch work? How do we affect the environment?

How does the hydrological cycle work? How does the nitrogen cycle in the nature work? How does the nitrogen cycle in the nature work? How does the feeding network in the nature work?

How does an electronic thermometer to measure the temperature of the human body? How does personal electronic weight? How does an electronic gauge for measuring blood pressure? How does electronic advertising lights? How does light „flashing" the Christmas tree? How does the flashing rear lights on your bike? How does the electronic lock on the code? How does the automatic ticketing on public transport? How How do electronic digital timer? How does the alarm clock?

1.1. The applets – *How does the iron work?*

1.2. The applets – *How does a kattle work?*

1.3. Applet – *Do you know the activity of the digestive tract in humans?*

2. Empirical research conducted into Java applets and Flash animations application in teaching process

The method of pedagogical experiment was used to compare the two teaching systems in the experimental group (the NIESVP system) and the control group (traditional teaching system). The principle of the pedagogical experiment is demonstrated in Fig. 1.


**Fig. 1. The principle of the pedagogical experiment**

The main aim of the experimental research was to investigate the possibilities of the NIESVP system application in order to increase the effectiveness of the teaching process.

The statistical interpretation of the research analyses findings is concise as the graphs are explicatory enough. They include the digital data related the values in question as well as the basic characteristics of the statistical ensembles arranged into the tables. As we find them sufficiently descriptive we do not provide any additional verbal explanations.

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Graph G.1.1 – Frequency distribution of learners' performances achieved in the final didactic test within the pedagogic experiment
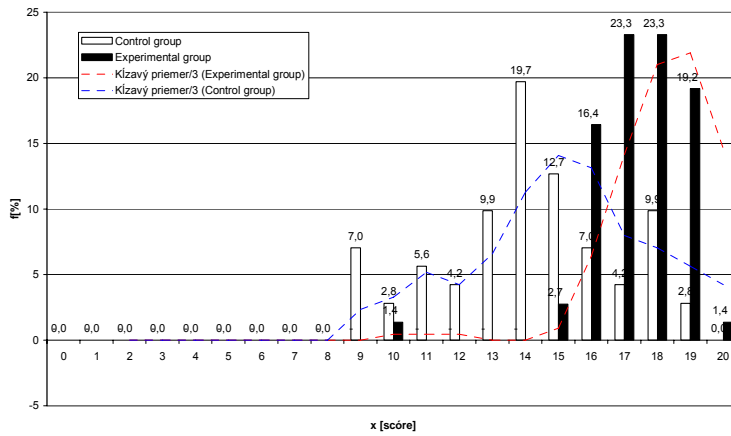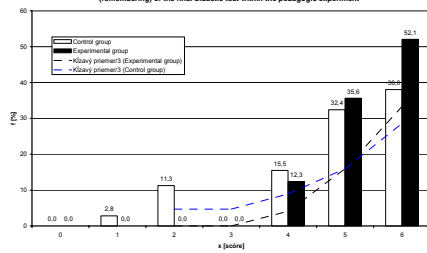

Graph G.1.2 – Distributive function of learners' (scores) achieved in the final didactic test within the pedagogic experiment
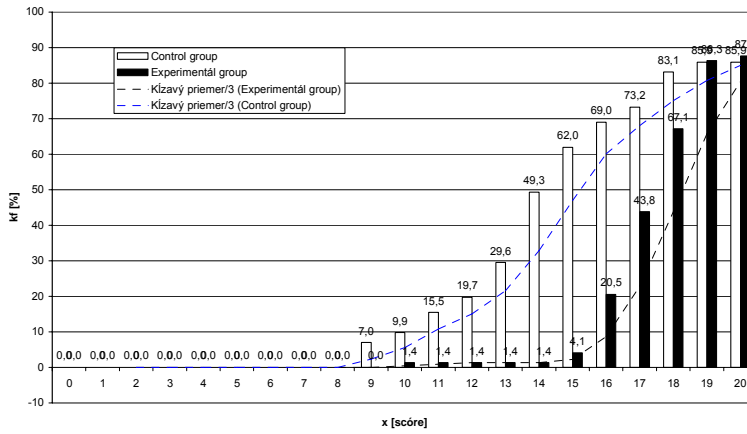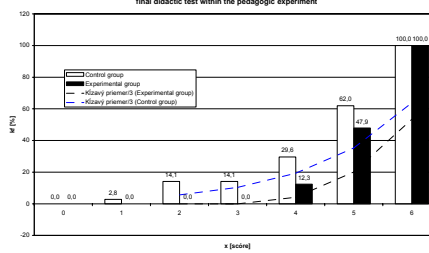

2.1. Some results of the structural statistical analysis on the level of subtests system created on the basis of Niemierko taxonomy levels of teaching


Graph G.2.1 – Frequency distribution of learners' performances achieved in subtest N1 (remembering) of the final didactic test within the pedagogic experiment
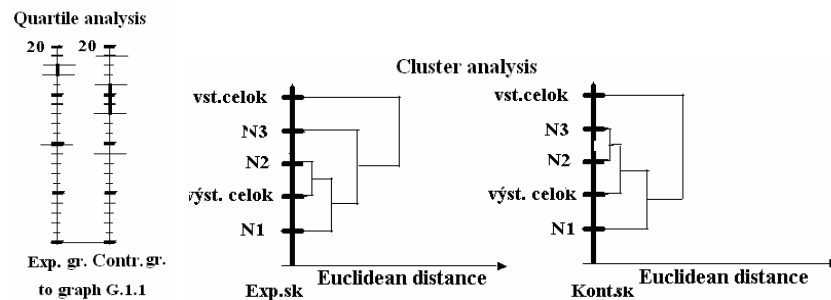
Graph G.2.2 – Distributive function of learners scores achieved in subtest N1 (remembering) of the final didactic test within the pedagogic experiment

2.2. Some another results of the structural statistical analysis on the level of subtests system
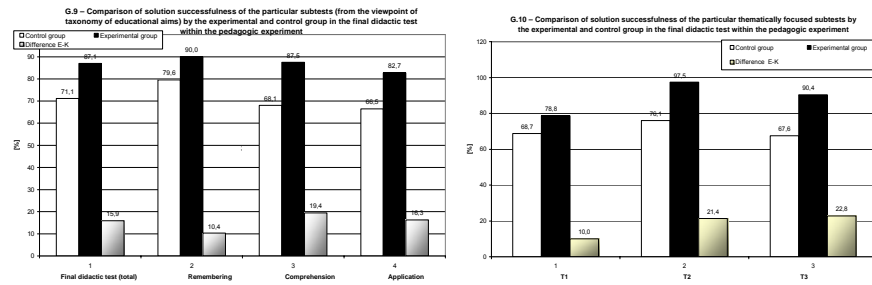
2.3. Some results of the quartile and cluster statistical analysis

3. The interpretation of the major experimental research analyses findings

The overall analysis of the application of the present innovative teaching system utilising computer animation and simulation of natural and technical processes and phenomena by means of Java applets proves the good prospectives of the introduction of the innovative system into school practice. Moreover, it proves the system to become a valuable tool for increasing the effectiveness of the teaching of teachers faculties. Furthermore, it provides evidence to be a help-ful means for achieving positive qualitative changes in students' knowledge structure. The most encouraging is the fact that the present innovative system can be introduced into the teaching process without any radical transformation of the traditional teaching system (and in our view it is its crucial advantage).

In addition, the NIESVP system was regarded as much more attractive and motivating than the traditional one by the participants of the research. What is more, the experiment students said that they were looking forward to being taught by means of NIESVP.

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The research findings confirmed that the Java applet application in teaching in natural and technical subjects is of great didactic importance.

Conclusion

The research findings confirmed that the Java applet application in teaching in natural and technical subjects is of great didactic importance. It broadens the horizon of visualization, application, didactic and educational possibilities which cannot be made available by traditional techniques of visualization of objects, processes and phenomena in the teaching process. Using Java applets which would enable us to visualize more illustratively some processes that cannot be visualized through the traditional means of visualization.

Literature

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Abstract

The paper reports the aspects related to Java applets creation and their application in teaching natural subjects. The authors of the paper also present the Java applets he himself created and applied in the natural teaching process. At the same time he emphasises the irreplaceability of didactic and professional mastership of a teacher in the teaching process using Java applet programs.

Key words: media education, promary school education, IT.

Jak funkcjonują prezentacje dydaktyczne wykonane w apletach Java i animacjach flash?

Streszczenie

W artykule przedstawiono aspekty związane z wykorzystaniem apletów Java do tworzenia zastosowania ich w nauczaniu przedmiotów przyrodniczych. Autorzy przedstawili również aplety Java, które sami stworzyli i stosowali

w naturalnym procesie nauczania. Jednocześnie zauważają niezastąpione dydaktyczne i zawodowe mistrzostwo nauczyciela w procesie nauczania z wykorzystaniem programów w języku Java.

Słowa kluczowe: edukacja medialna, edukacja wczesnoszkolna, technologie informacyjne (IT).