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Studying numbering of numbers in elementary school with the use of interactive electronic posters

The article examines the possibility of providing elementary school with demonstration means of study, namely, interactive electronic posters. The author proves that interactive electronic posters come in place of classic posters. They have undeniable advantages over other demonstration tools. The example of the electronic educational resource «Numbering of numbers» is given, which can be used in mathematics classes in elementary school in grades 1–4 in the process of studying this topic. The model of this electronic educational resource is developed, described its structure, screenshots of interactive posters included in this resource are provided. The description of the capabilities of each of them is given. On the example of this electronic educational resource «Numbering of Numbers» it was analyzed which types of interactivity can be used in interactive posters. When working with interactive posters, the teacher can, together with his students, move objects along the electronic page while studying the new material, execute the corresponding entries from the keyboard and using the special buttons, close and open the records and images. The use of interactive posters allows the teacher to demonstrate processes using the animation, instantly clean the electronic page from the used images and records.

Keywords: Primary School, mathematics, model, electronic educational resource, interactive e-poster, Adobe Flash, Action Script.

Activation of activity, increase of motivation of education is an important task of children's development in elementary school. Taking into account age characteristics of perception of information, ability to work in the information environment at a young age, understanding the role of information and communication technologies in education and public life becomes an important component of the competence of a modern teacher. It necessitates the provision of a level of readiness for pedagogical and design-methodical means. Consequently, the development of new electronic learning tools, in particular for teaching mathematics in elementary school, based on modern computer technology, taking into account the existing pedagogical experience and achievements of psychological and pedagogical sciences is especially relevant.

The pupil thinks, according to Ushinsky's statement, «shapes, colors, sounds, feelings at all» [1]. His thinking is characterized as concrete-shaped. Accordingly, initial education should be fully explained. At junior school students a small stability of attention, they are characterized by frequent distraction. In this regard, from the first lessons, it is necessary to «educate» attention. You can imagine the work of a teacher without visual methods as it is known that pre-schoolers and junior schoolchildren predominates visually-figurative and visually-effective thinking [2]. In primary school students there is a rapid development of abstract thinking, especially in mathematics lessons, where from actions with specific subjects pupils pass into mental operations with numbers. With the beginning of schooling, students develop conceptual thinking, in which the learner begins to operate concepts [3]. It is known that elementary school teachers do not spend any lessons in elementary school without using visual teaching aids in the educational process. Visual education tools are designed to help younger schoolchildren successfully master the teaching material and study it at a qualitatively new level [4]. With the advent of computer technology, teachers began to actively use teaching methods on electronic media at various stages of the lesson, including for the presentation of educational material.

According to E. Savchenko, the use of information technology in elementary school at the lessons of mathematics not only increases the cognitive interest of students, but also contributes to the creative development of teachers, makes it possible to feel both the script writer and the director of his lesson, to make such a scenario lesson, which is necessary in this class on a particular lesson [5]. This encourages pupils to think actively, seek the most rational ways to solve problems, and help them learn knowledge and master the ability to apply them. The use of information technology in primary school classes can effectively form the persistent cognitive interest, skills of mental activity, creative initiative and pupil autonomy in search of ways to solve problems [6].

One of the most effective types of electronic educational resources that are used in conducting training sessions is an interactive poster. The word «interactive» came to us from English from the word «interact».

Interactive poster — an educational poster with interactive navigation that allows you to display the necessary information: graphics, text, sound. Compared with conventional posters or electronic posters, interactive e-posters are a modern multifunctional learning tool and provide more opportunities for the organization of the learning process. Interactive posters are primarily intended for use in the study of new material, but they can also be used in the process of repetition and consolidation of the study [7–10].

Consider the interactive e-poster «Numbering of numbers».

The electronic educational resource «Numbering of Numbers» consists of five interactive posters:

– «Numbering of the numbers of the first ten».
– «Numbering of numbers within hundreds».
– «Numbering of numbers within a thousand».
– «Numbering of multi-digit numbers» (six-digit numbers).
– «Numbering of multi-digit numbers» (nine-digit numbers).

Having examined the model of the electronic manual (Fig. 1), you can see that it consists of a title page and a page on which the content of this manual is located. From the title page (Fig. 1), the teacher can go to the electronic pages for information about the authors, used resources and instructions. It should be remembered that the work with each electronic educational resource must begin with an introduction to the instruction. On the model, these pages are on the left. In order to select the desired e-page to study the numbering, you must go to the page where the content of this electronic educational resource is located. From this page you can go to any e-poster of this electronic educational resource. To select the desired interactive poster, you need to go back to the Content page and select it. The interactive posters on the models are located on the right and are indicated by the numbers 1–5. Navigation buttons are indicated by blue and red colours. The paths of the transitions are represented by the blue and red colours respectively. The buttons are indicated in blue, with which you can choose the appropriate ES, and red — return to the content page or to the title page.

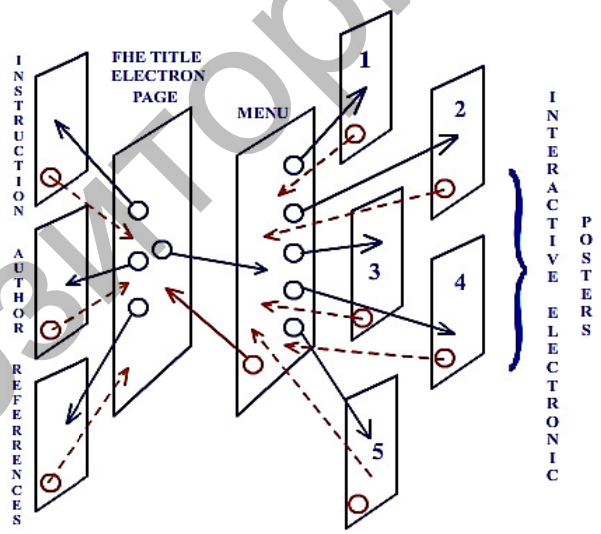

Figure 1. Model electronic educational resource «Numbering of Numbers»

Let's move on to the electronic educational resource «Numbering of numbers».

This resource is made using the Adobe Flash system. The content is structured in the same way as Microsoft Office PowerPoint. You can manage this resource using the built-in ActionScript programming language. No object of this resource works on its own. It should get the command in ActionScript. Navigation is performed using the buttons:  ,  ,  ,  .

In Figure 2 depicted the title page and the electronic page on which the teacher can choose a certain e-poster.

Figure 2. Image of the title page and an electronic page giving the opportunity to choose the appropriate interactive poster

Working on the development of a separate electronic page, meaningful content has been made which would contribute to a better assimilation of pupils on this topic. The design of every e-page is thought out. The connection of the elements is done using the built-in Action Script programming language. Consider all the electronic posters of this e-learning resource and the interactive effects used in this electronic educational resource.

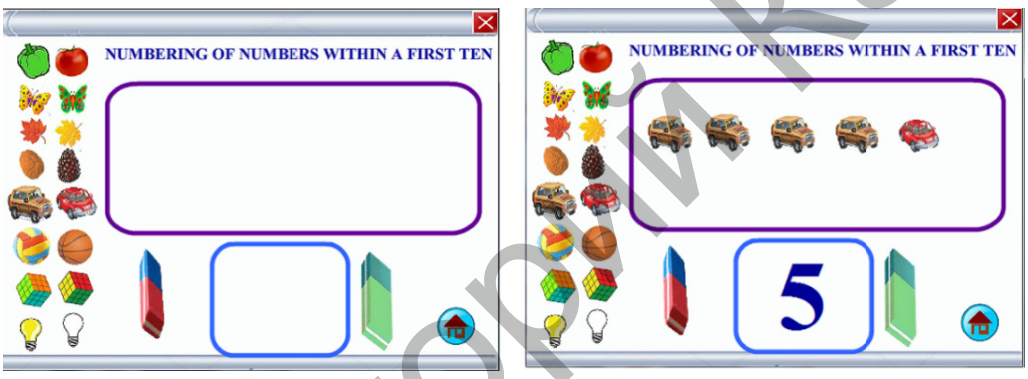

Figure 3. Interactive poster «Numbering of the numbers of the first ten»

The following interactive effects are used on this email page:

1 effect: Moving objects along an electronic page. All items that are located on the left side of an electronic page can be moved (Fig. 3). This is a counted material. All subjects by 10, a teacher can use this poster on any lesson in the first class.

2 effect: Recording numbers from the keyboard in the assigned location.

3 effect: Clearing an electronic page from used images and unwanted entries. This is a very convenient effect, with the use of the blue-red and green colors, the return of the electronic page to its original state is carried out.

The teacher conducts the work in the following way: arranges for himself or with the help of pupils certain images in the appropriate place. After the pupils have counted objects, this number of items should be marked with an appropriate number by entering entries from the keyboard.

Consider interactive posters for studying numbering within hundreds and thousands (Fig. 4). All effects of interactivity are the same as in the previous case. The method of working with these posters is similar to the method of work that is carried out while studying the numbering of numbers within 10.

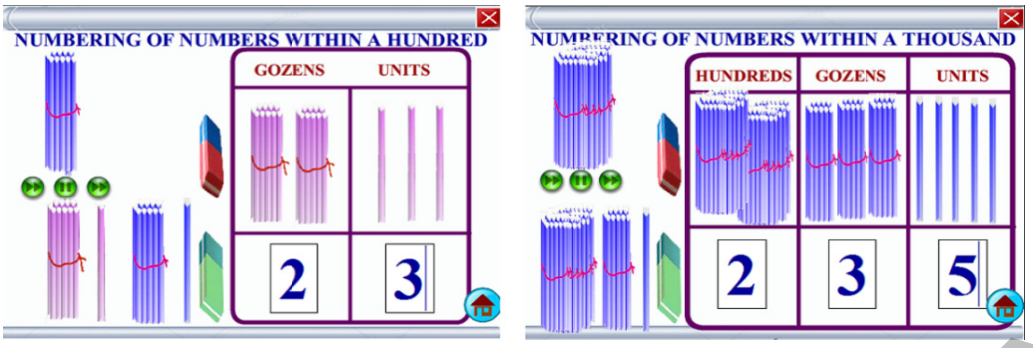

Figure 4. The image of interactive posters for studying numbering within hundreds and thousands

But these posters have a fourth effect of interactivity — the use of animation (Fig. 5). Pupils can observe the process of creating new count units — a dozen or hundreds by clicking on the image of the green button. The animation can be stopped and you can continue the demonstration or start from the beginning.

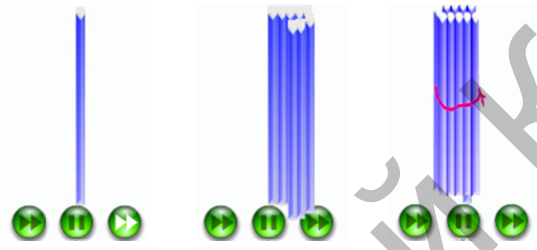

Figure 5. Demonstration of the creation of a new unit of measurement «Ten» in an interactive electronic poster «Numbering of numbers within hundreds»

All images (Fig. 4), as in the previous case, by 10. The exception is only images intended to display a new unit of account.

Pupils have the ability to form numbers in the hundreds and thousands and record them in the designated places with the use of interactive posters.

Consider the following interactive posters, which should be used in the process of studying the numbering of multi-digit numbers (Fig. 6). These interactive posters are intended for better assimilation by pupils of elementary numbers for the numbering of multi-digit numbers. Left on fig. 6 is a table for the assimilation of the numbering of six-digit numbers, and the right — nine-digit. In these posters, you can enter entries in two ways: directly using the buttons specially programmed in interactive posters (on the left in Fig. 6) or on the keyboard (on the right in Fig. 6).

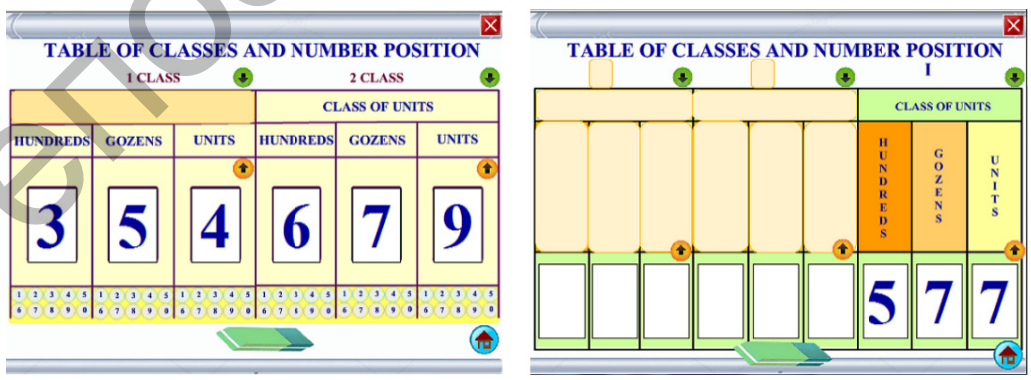

Figure 6. The image of interactive posters for studying numbering within multi-digit numbers

These posters have buttons that allow teachers to close and open records. This is the next effect of interactivity, which allows the teacher to control how students learned the names of classes, units of discharges. With orange buttons, you can close all entries, and use the green buttons to open them. The teacher has the ability to open the record gradually by clicking on the images themselves. For example, in the case when the

student answered the question. The teacher can do the work and otherwise. When entries are open, pupils have the opportunity to repeat the training material. Then, the teacher closes the relevant information and checks how the pupils know this training material.

These posters should be used to familiarize themselves with the concept of class, with the names of digits in each class. These interactive posters can be further used as training. Pupils practice reading and writing multidimensional numbers. The presence of names of digits and classes in many ways helps students to navigate in large numbers, to write them correctly. Using the Smart Installer system, a distribution has been created (Fig. 7). Using this distribution, a teacher can install this software on a computer or, if necessary, uninstall it.

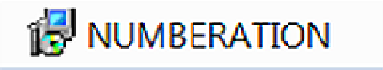

Figure 7. The image of the final version «Numbering of numbers»

These posters serve as important help both for teachers and pupils. They not only contain educational material, but they can also provide it in a more effective and visual form. Due to the use of interactive elements one of the most important tasks set before electronic educational resources can be solved: attraction of attention of the pupil and his involvement in active cognitive activity.

Conclusions. In this e-learning resource have been used 5 effects of interactivity. These are: providing the ability to move objects along the electronic page, giving the ability to enter numeric values using the keyboard or using special buttons, using animations to display the Tens and Twenty count units, allowing you to close and open notes in a convenient time for the teacher and students, clearing electronic pages from images and records. The use of interactive posters in mathematics classes has shown that this electronic resource is needed both for teachers and pupils in order to better master the topic of Numbering of Numbers. Interactive e-posters are a didactic tool that can be used to learn new knowledge and consolidate and improve knowledge, skills and abilities. Applying them to classes in elementary classes helps to improve the educational process, develops creative abilities, and prompts the lively interest of junior martyrs. The use of the above-mentioned interactivity effects in interactive electronic posters «Numbering of Numbers» promotes the intensification of labor as a teacher and a pupil.

At the same time, the created electronic learning resource «Numbering of numbers» does not satisfy all the needs of the teachers of the initial level of education in the presentation of the educational process of the elementary school. Subsequent studies require the development of interactive posters on other topics that are studied in elementary school.

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О.А. Рыбалко

Интерактивті электронды плакаттарды пайдаланып бастауыш мектепте нөмірлеуді оқыту

Мақалада бастауыш мектептерді көрнекі оқу құралдарымен, атап айтқанда интерактивті электронды плакаттармен қамтамасыз ету мүмкіндігі қарастырылған. Автор классикалық плакаттардың интерактивті электронды плакаттармен алмастырылатындығын дәлелдейді. Олардың басқа демонстрациялық құралдармен салыстырғанда айрықша артықшылықтары бар. Бұл тақырыпты зерттеу барысында 1–4 сынып оқушыларының бастауыш сыныптарындағы математикалық сабақтарда қолдануға болатын «Сандарды нөмірлеу» электронды оқыту ресурсының мысалы келтірілген. Электронды білім беру ресурсының үлгісі әзірленді, оның құрылымы сипатталды және осы ресурста қамтылған интерактивті плакаттар скриншоты ұсынылды. Олардың әрқайсысының мүмкіндіктерінің сипаттамасы келтірілген. «Сандарды нөмірлеу» электрондық білім беру ресурсының мысалында интерактивті плакаттарда қандай интерактивтілік элементтерін қолдануға болатыны талданды. Интерактивті плакаттармен жұмыс жасаған кезде, мұғалім өз оқушыларымен бірге объектілерді электронды бетке жылжытуға, жаңа материалдарды үйренуге, арнайы түймешіктерді қолдана отырып жазбалар мен суреттерді ашу және жабуды, пернетақтамен тиісті жазбаларды орындай алады. Интерактивті плакаттарды пайдалану мұғалімге анимацияны қолдану арқылы процестерді көрсетуге, электронды бетті қажет емес сурет пен жазбалардан тез арада тазартуға мүмкіндік береді.

Кілт сөздер: бастауыш мектеп, математика, сандарды нөмірлеу, үлгі, электрондық білім беру ресурсы, интерактивті электронды плакат, Adobe Flash, Action Script.

О.А. Рыбалко

Изучение нумерации чисел в начальной школе с использованием интерактивных электронных плакатов

В статье рассмотрена возможность обеспечения начальной школы демонстрационными средствами обучения, а именно интерактивными электронными плакатами. Автор доказывает, что на смену классическим плакатам приходят интерактивные электронные. Они имеют неоспоримые преимущества перед другими инструментами обучения. Приведен пример электронного образовательного ресурса «Нумерация чисел», который можно использовать на уроках математики в начальной школе в 1–4 классах в процессе изучения данной темы. Разработана модель данного электронного образовательного ресурса, описана его структура, предоставлены скриншоты интерактивных плакатов, входящих в электронный ресурс. Дано описание возможностей каждого из них. На примере электронного образовательного ресурса «Нумерация чисел» проанализировано, какие элементы интерактивности можно использовать в интерактивных плакатах. Во время работы с интерактивными плакатами учитель может вместе со своими учениками перемещать объекты вдоль электронной страницы, одновременно изучая новый материал, выполнять соответствующие записи с клавиатуры и, используя специальные кнопки, закрывать, и открывать записи и изображения. Использование интерактивных плакатов позволяет учителю демонстрировать процессы с использованием анимации, мгновенно очищать электронную страницу от ненужных изображений и записей.

Ключевые слова: начальная школа, математика, нумерация чисел, модель, электронные образовательные ресурсы, интерактивный электронный плакат, Adobe Flash, Action Script.

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