

FUNCTIONAL CAPABILITIES OF THE DESIGN OF VIRTUAL LABS

*Begalin A.H.,
Lifenco V.M., candidate of physical
and mathematical sciences,
KSU of. A. Baytursynova, Kazakhstan*

Аннотация

Жұмыста көз мөлшерімен программалай ортасының қаржысын электрондық виртуалды зертхана жасаудың төңірегідегі зерттеу нәтижелерді ұсынады, систем үйретуші программа конструкторларын жасауды үшін әр түрлі аспаптық құралдарының ықпалдасуының сұрақтары мұндай қаралады. Жасаудың жасалған әрекеті әмбебап және оқушы бастанқы өнер-білімдерінің деңгей ескеретін көп қызметті бағдарлама.

Аннотация

В работе предлагаются результаты исследований в области создания электронной виртуальной лаборатории средствами визуальной среды программирования, рассматриваются вопросы интеграции различных инструментальных средств для создания конструктора таких обучающих систем. Сделана попытка создания универсальной и многофункциональной программы, учитывающей уровень первоначальных знаний обучаемых.

Abstract

In work results of researches in the field of creation of electronic virtual laboratory by means of the visual environment of programming are offered, questions of integration of various tools for creation of the designer of such training systems are considered. Attempt of creation of the universal and multipurpose program considering level of initial knowledge of trainees is made.

Түйінді сөздер: виртуалды зертхана, бағдарлама, каталог, оку жүйесінің дизайнері, мәліметтерді шифрлеу, шифрді айыру

Ключевые слова: виртуальная лаборатория, программа, дизайнер учебных систем, мультимедиа, шифрование данных, расшифровка, каталог.

Keywords: virtual lab, programme, designer of learning systems, multimedia, data encryption, decryption, catalog.

Introduction: At present, the development of electronic virtual laboratory imposed more stringent requirements. It means the use of multimedia computer in order to engage all the senses of the student: vision, hearing and motor memory. Electronic laboratory must not only submit the information in a colorful train, but also control the level of Learning, to control the speed of presentation of information and calculate the trajectory of learning. Some students are receptive to the material – their training can be accelerated by skipping lessons topics. Students who are struggling to accept the material several times to return to the study of selected topics in more detail to clarify certain issues, to conduct more experiments.

Materials and methods: The proposed e-constructor of virtual laboratory designed to make the most of all requirements, automate the process of learning to individual approach to every student in the light of his temperament, mental capacity, availability and quality of knowledge on the subject under study, to control the volume and rate of presentation, to control the level of knowledge.

The existing electronic textbooks have one drawback – it's very difficult to create them and only people who are familiar with the structure of the textbook and knowing how to program well can do it. However, this process can be greatly simplified if we use the software designer. The program itself could complete virtual lab prepared in advance material. In this case, would require the presence

of minimal skills of PC user. All routine work on its creation will take on the designer developed. There is a real opportunity to bring to electronic virtual laboratory professionals in other fields, not related to programming – mathematicians, physicists, linguists, veterinarians, lawyers, etc.

Designer injection makes a long and laborious process fun, giving a lot of pleasure, greatly reduces the time creating learning systems.

Comparative analysis shows that the use of such design is ten times reduce the time spent. It can be created within a few days, while in programming "from the beginning" would take months of hard work.

However, do not consider that released software will "look alike". "Person", the style of presentation depends just on the content of the pledged in his study material. The style, manner of presentation of these textbooks will be unique.

The question of testing students' knowledge and credibility assessment is becoming more relevant than ever. Numerous test systems that were created in recent years, given the various indicators in determining the level of knowledge. To increase the efficiency of knowledge control program is needed, taking into account the peculiarities of thinking and combining different forms of testing.

The program developed by e-virtual laboratory consists of a set of functional routines. Consider a few of them.

A-TC – a program for creating test files;

A-ST – program to run test files;

Operating principle of programs A-TC and A-ST.

Create a new test or open an already created is accompanied by the same name in the directory folder to store the questions. Files in this folder have the extension ". ts" and name to match the number of questions. These can be accessed by tens of times faster than the full file. All files are encrypted using the algorithm encryption RC4, which eliminates the ability to view data at design time or during the response to the test. In the beginning, when you open a test file with great speed by differentiation of its component files, the process is almost negligible with a small number of issues. At the end of the work at the completion of the program and maintaining test all its components are compiled into one, with the extension ". ots", it also added to the test setup, while the output of these components are removed along with the folder.

When accessing any file decryption occurs while you retrieve all necessary data, and decryption is repeated.

In operation, the program is implemented the process of comparing user responses to the original answer and evaluation, by exhibiting the corresponding points. In every school there are different limits of certain estimates and therefore the successful implementation of the test set shows earned interest (*Picture 1, 2*).

When installing options, "Number of questions:" or "Number of points:" and "Shuffle" comes into play in their processing algorithms.

Number of questions: among all the available database of test questions randomly selected a number that is specified in this field, but on condition that the number is less than the number of existing problems, or are displayed in random order, all the questions in this test.

Number of points: among all available in the database test questions randomly selected a number of issues, levels of complexity that adds up to a certain real number. If among all the options there is not one identical to this number, all questions of this test are displayed in random order. In identical conditions can be derived a different number of questions; it depends on the amount of difficulty levels of questions.

Results:

Description of the program.

The working directory of the program contains a folder «Data» and «Test».

In the folder «Data» – stored test results. The file "**data.txt**" contains encrypted information about pupils who performed the test, the name of the test, the test author, the number of outstan-

ding issues, the percentage of points outstanding issues to the total number (Fig.1-2), the time during which the test was done and the date and time when the test was set. The last student who answered the test is entered to the top of the list.

In the folder «Tests» – the created tests are located. The files have the extension " *.ots ", which is the actual test. Files can be renamed, copied, deleted and added.

Folders «Data» and «Tests» are created when you first start the program.

The working directory of the program also contains the files "Results.exe", "TesterTC.exe", "TesterST.exe", "OpenRTF.exe", "SaveRTF.exe" and "about.txt".

"TesterTC.exe" – "Teacher Program." To create and edit tests.

"TesterST.exe" – "The program of students." Is a program open to test their performance.

"OpenRTF.exe" – a program to convert the test typed in RTF, in the test file (*.OTS)

"SaveRTF.exe" – a program to convert the test (*.OTS) to a file in RTF.

"Results.exe" – a viewer of test results, which are taken from the file "Data \ data.txt"

"About.txt" – A text document containing the help text.

Discussion:

Functional abilities of A-Tester programme:

- ✓ The number of questions is not limited.
- ✓ Number of answers from 1 to 10 for every question.
- ✓ The order of every answer variant should be random.
- ✓ Three types of answer variants:

Common – it is needed to choose only one variant from the all given.

Multiple-choice – it is needed to choose several answers from the all given. The answer is correct only in that case if all the ticked answers are correct.

Closed – People who do the test should write the answers by himself.

✓ Installation of different levels of complication (A, B, C, D, E) and number of points for every question.

✓ The opportunity to insert graphic objects as images formulas of Microsoft Equation to questions and answers

✓ The ability to insert the data from the buffer exchange, without the loose of format. It means that the text would be the same as it is in text editors, for example, Microsoft Word.

✓ The possibility to install the time of test doing and number of questions which are put out in once, or points that the person who do the test have to get.

✓ A huge spectrum of options and settings for the test. The change of text format.

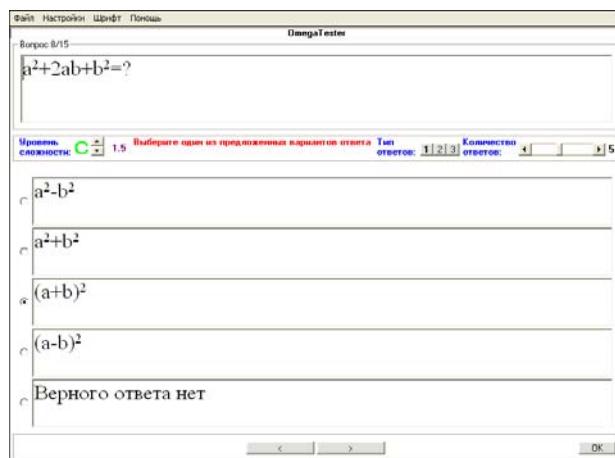
✓ Coding of data. There is no test could be seen with the help of other programme. All files are saved with the extension «.ots» and coded according the algorithm RC4.

✓ Installation of passwords:

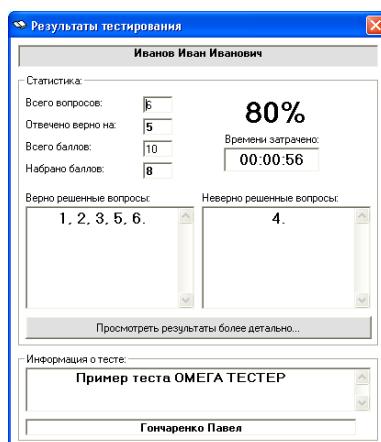
For test editing – test can be changed (to edit, to delete questions, to change settings, correct answers) only after password insert, which was made by the test author himself. It means that the test change can do only person who knows the password.

For test opening – test can be done only after password insert, which was made by the test author himself. It is useful in the case when test are done in advance and their execution have to be done in a certain day. When it is needed the password can be changed as other test settings.

- ✓ The tally of students who did the test is kept.
- ✓ The opportunity to reform the file format RTF into test file (*.OTS) and vice versa.
- ✓ Different hints and key combinations.
- ✓ The programme is simple in use.



Picture 1. The main working window of A-TC



Picture 2. The window of test results