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Book 5

Mathematics, Informatics and Physics

Volume 10, 2013

RUSE

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The Union of Scientists – Ruse (US – Ruse) organizes publishing of scientific and popular informative literature, and since 1998 – the "Proceedings of the Union of Scientists- Ruse".

BOOK 5

"MATHEMATICS, INFORMATICS AND PHYSICS"

VOLUME 10

CONTENTS

BOOK 5

"MATHEMATICS, INFORMATICS AND PHYSICS"

VOLUME 10

This is the jubilee 10-th volume of book 5 Mathematics, Informatics and Physics. The beginning was in Spring, 2001, when the colleagues of the former section Mathematics and Physics decided to start publishing our own book of the Proceedings of the Union of Scientists – Ruse. The first volume included 24 papers. Through the years there have been authors not only from the Angel Kanchev University of Ruse but as well as from universities of Gabrovo, Varna, Veliko Tarnovo and abroad – Russia, Greece and USA.

Since the 6-th volume the preparation and publishing of the papers began to be done in English.

The new 10-th volume of book 5 Mathematics, Informatics and Physics includes papers in Mathematics, Informatics and Information Technologies, Physics and materials from the Scientific Conference 'Information Technologies in Education' (ITE), held at the University of Ruse in November 2012 in the frame of Project 2012-FNSE-02.

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CREATING AN E-TEXTBOOK FOR THE COURSE WORKSHOP ON COMPUTER NETWORKS AND COMMUNICATION

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***Abstract**: The IT development gives further opportunities to the distance learning through e-textbooks. E-textbooks are undoubtedly of great convenience as learners could control studying in accordance with their speed and aptitude for learning. E-textbooks assist the process of comprehension and training: learners could choose relevant fields of interests; they could zoom out images and test the knowledge gained at any step of learning. Video tutorials, dictionaries, abbreviations list are also available, as well as a good number of useful links for those who are eager to learn.*

***Key words**: distance learning, e-textbook, graphical user interface, visual programming environment, user form.*

I. INTRODUCTION

E-textbooks become more popular with the development of the information technologies. The replacement of paper textbooks with electronic ones is owed to the following advantages:

- e-textbooks could be continually updated;
- they are cheaper having no issuance expenditures;
- they are accessible and interactive;
- the learner could determine the speed of studying, depending on his aptitude and knowledge gained to the moment;
- e-textbooks offer various tools for visualization and easier perception of the material taught including tasks, tests, images, video tutorials, as well as additional useful links for the advance learners;
- e-textbooks provide mobility, as they could be transferred (copied) from PC to PC; they could be used on tablets, e-readers and other digital devices which support relevant technology and have adequate displays.

It is confirmed that the more senses in the process of learning are involved, the better and long-lasting is the knowledge gained. In general, an individual memorizes:

- 10% of what is read;
- 20% of what is heard;
- 30% of what is seen;
- 50% of what is heard and seen.

Since the e-textbooks combine different visualization tools it is evident from the above stated statistics that they are much more convenient and helpful in the comprehension of the teaching material. Nowadays learners could find plenty of e-textbooks on the web.

An e-textbook is featured with the following items:

- Easy and straightforward design.
- Extensive workspace for content visualization.
- Various buttons with links to different forms.
- Tests for self-study and knowledge self assessment.
- An option for video clip addition.

- Alphabetical list of abbreviations and terminological dictionary.
- Buttons with links to additional information.

II. SYSTEM DESIGN

The application is designed with Windows Forms which is a standard library of .NET Framework for constructing windows based graphical user interface (GUI) for desktop applications, including SharePoint and Cloud. The Windows Forms Framework provides a straightforward object-oriented group of classes that enables the development of mighty applications for Windows [2, 3].

The form is part of the screen, usually in a rectangular shape, intended for visualization of user information. The forms could be standard windows, dialogue fields or areas for displaying diagrams/charts. Each form includes appearance determination controls, behavior determination methods and user interaction events.

Presentation of all forms of software application for creating an E-textbook and their inheritance is shown in Fig.1.

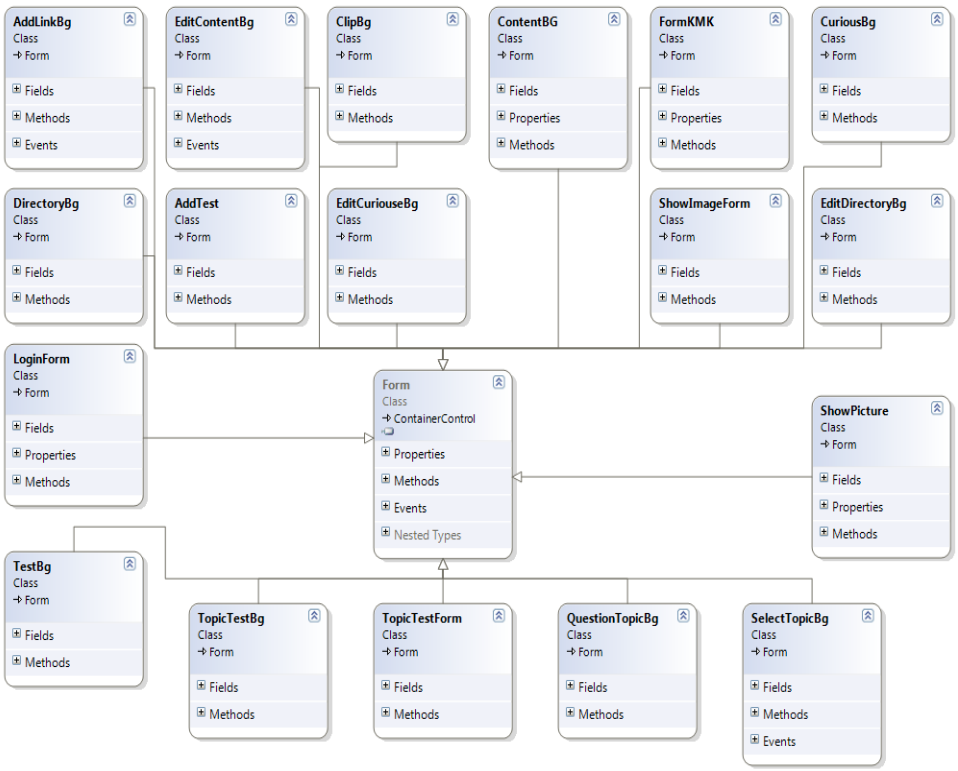

Fig.1. Inheritance used for E-Textbook forms

The e-textbook, described herein, has been created with the help of Microsoft Visual Studio 10. The application is implemented in C#, being one of the leading modern programming languages. As a component of the Microsoft .NET technology, it is an object-oriented programming language, developed by Microsoft as a part of the .NET software platform. The C# programming language elaboration was focused on the development of a modern object-oriented programming language in general use. C# stepped on its predecessors: C++, Java, as well as Delphi, VB .NET and C to some extent. It is as mighty as C++ having the capacity for a fast continual development like Visual Basic and Java. C# involves a set of classes' definitions which contain methods and the methods themselves include the programming logics, i.e. the instructions which a computer executes [1].

III. E-TEXTBOOK OPTIONS

The system provides the following options:

- Choosing a language: the system is designed to be run in two languages – Bulgarian and English. The language could be chosen with the start of the application (Fig.2).

Fig.2. Choosing a language

- Choosing the logon rights: immediately after the language choice, the user selects the option to access the system. Two options are provided for running the system – by user's (student's) or administrator's account (Fig.3).

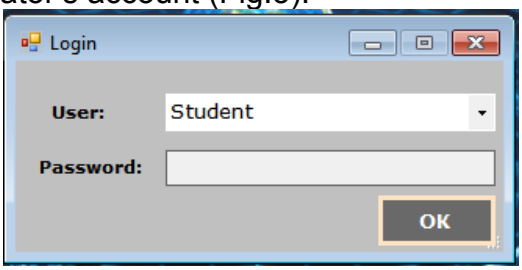

Fig.3. Choosing the logon rights

The student's account provides the possibility to start the course study and further determine the tools for goals accomplishment. The system basic window is displayed as follows (Fig.4):

Fig.4. Basic window of options

- Option for choosing the theme of studying (Fig.5).

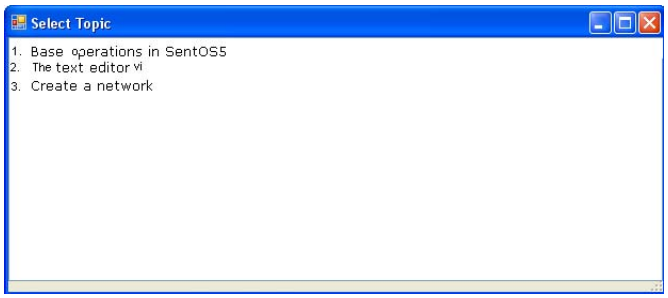

Fig.5. Choosing the theme of studying

- The learner could check his progress by filling a questionnaire on the topic. The answer to every question of the test could be verified by pressing the button “Answer” which displays the correct answer (Fig.6).

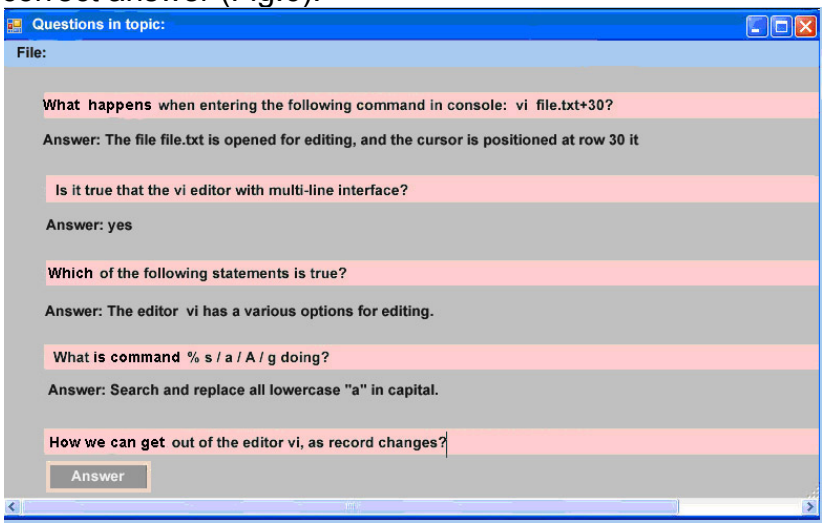

Fig.6. Test result at the end of a topic

- The application is capable in forming the final assessment after student’s completion of the course study.

- Student’s knowledge is evaluated by conducting a test, including all themes of the course (Fig.7).

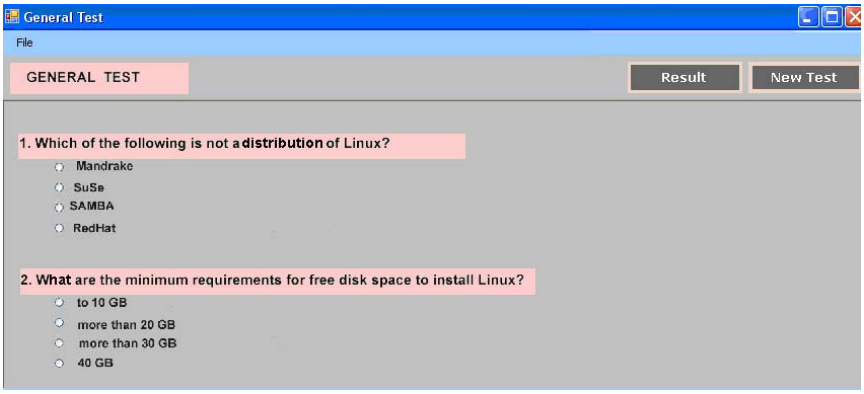

Fig.7. Test control knowledge after studying the whole subject area

- Option for using the incorporated terminological dictionary and abbreviations (Fig.8).

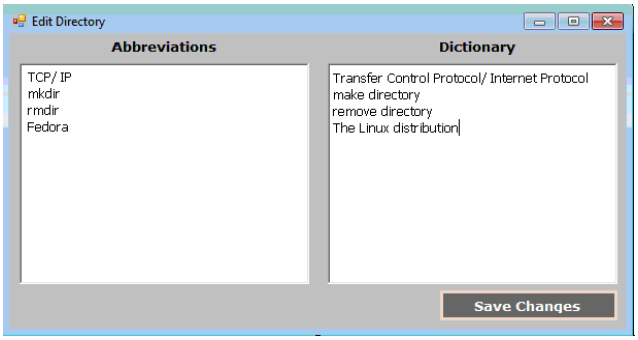

Fig.8. Dictionary of new incorporated terminological and used abbreviations

- Option for video clip addition to any course theme (Fig.9).

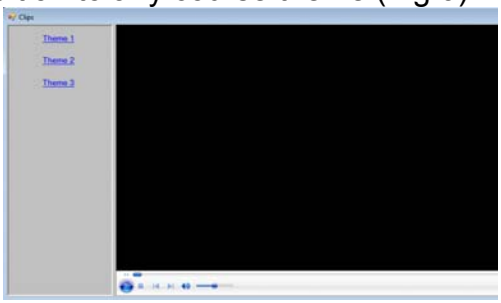

Fig.9. Clip addition

- Opportunity for the advance and inquisitive learners to get further information in the subject domain by following the offered useful links (Fig.10).

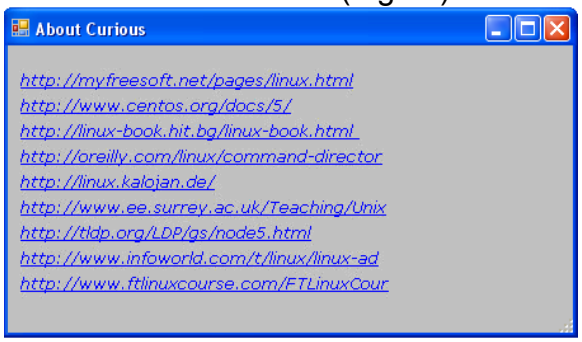

Fig.10. Useful links

The administrator's account is intended only for the tutor. He has the rights to:

- Add or remove a course theme.
- Correct an existing theme.
- Add or remove tests, used for consolidating learners' knowledge after a theme completion. Every test item provides a multiple choice answer (Fig.11).

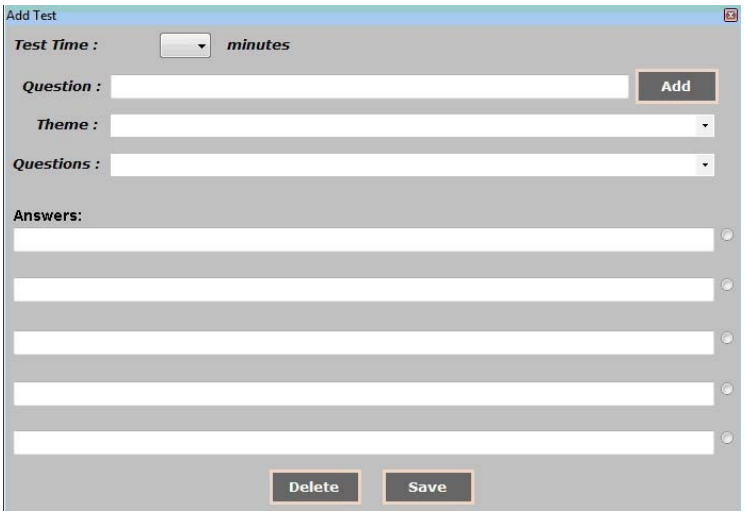

Fig.11. Create a new test

- Add or remove tests intended for consolidating the knowledge gained after the whole course completion.
- Change the set time for conducting the test (Fig.12).

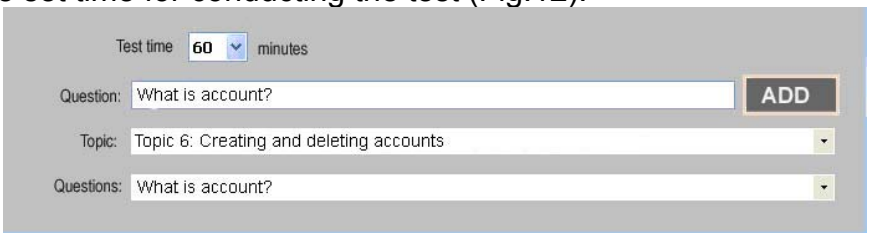

Fig.12. Set the time to finishing the test

- Add new links to websites which could be of interest to the advance learners.
- Add or edit the existing lists of abbreviations and specific terms.
- Add or delete existing video clips attached for a given theme course.

CONCLUSION

The so designed system for E-Textbook could be used by all teachers and students in various disciplines. The system provides a variety of learning opportunities. The main advantage is that the learner himself is to set the pace of adoption of the material. The principal disadvantage is that the system is not yet a web-based.

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ЕЛЕКТРОНЕН УЧЕБНИК ПО ДИСЦИПЛИНАТА ПРАКТИКУМ ПО КОМПЮТЪРНИ МРЕЖИ И КОМУНИКАЦИИ

Виктория Рашкова, Методи Димитров

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Резюме: *С развитието на информационните технологии дистанционното обучение посредством електронни учебници намира все по-широко приложение. Основната причина е, че електронните учебници създават голямо удобство на обучаемия - предоставят му възможност сам да управлява процеса на обучение, съобразно своето темпо и нагласа; предоставят му разнообразни средства за спомагане на процеса на възприемане и обучение, като потребителят сам прави избора си на тема; възможност за увеличаване на изображенията; възможност за проверка на знанията си на всеки етап от обучението; видео уроци; предоставени речници и списъци с използвани съкращения; множество полезни връзки за по- любознателните обучаеми.*

Ключови думи: *дистанционно обучение, електронен учебник, графичен потребителски интерфейс, визуална среда за програмиране, потребителски форми.*

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