

CREATING A TRAINING SIMULATOR FOR THE ECONOMIC DISCIPLINES AND ITS FUNCTIONALITY

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Abstract: *One way to improve the quality of distance learning subjects in economics is the development and application in the process of training of trainers and simulators. The article defines the necessary requirements to simulators for the subjects of economic profile. The technology training and learning using the software package developed by the author - trainer "Cyber2T". Attention is concentrated on the stage of the debriefing. A method of analyzing and summarizing the results of the training is done using logical probabilistic model to predict the possible errors and assumptions form the recommendations to correct them."Cyber2T" designed to "Cyber2" basis -. The system of identifying and evaluating the development of knowledge "Cyber2T" written in VB.NET 2010, the database is organized to SQL Server 2008.*

Keywords: *"Cyber2T"; Simulators-trainer; knowledge systems; Simulator of economic subject.*

Introduction

Various kinds of trainers and simulators have been employed for training the complex technical system exploitation and operation specialists. The article describes [1] the trainers used in the Russian Federation. In the recent years, various medical universities worldwide have been widely employing simulators [2] for training and professional advancement of the medical personnel. It may be said, that mainly physical, electronic and combined simulators are being developed.

There are multiple type and purpose simulators employed not only for training the technical system exploitation and operation specialists and medical personnel but those to be used in their further professional activities.

It should be said though that merely electronic trainers and simulators can be developed and employed where training of economists is concerned. Electronic trainers are broadly developed and exploited in training the operators, e.g. the railway ticket or the passenger carriage heating system operators, etc [3].

There are some interesting studies (theses) depicting development of the trainers designed for various fields of economics [4, 5].

Analysis of the available materials reveals disparity of opinions concerning the concept of electronic trainers and simulators. Some of the scholars state that the electronic trainer is a combination of a hypertext-based manual and software and data complex. The electronic manual is for familiarization and comprehension of an issue, while the software complex is conducive to remembering it. In an interactive mode, a student solves tasks and answers theoretical questions. IN answering a student uses textual, graphical or video prompts and gets scores, etc. The Training may be performed repeatedly, with its content, time etc. changed at one's own discretion. It is distant, individual learning.

The simulation modeling implies the software and data environment in which a specific, real-life, typical situation is being modeled. In the instruction, the simulators are used for the purpose of learning how to manage the situations concerning a real, physical item, make the relevant decisions and analyze its results.

Based on the available data, the students are taught how to model a specific situation, see and assess the anticipated results. It should be said though that similarly to the electronic diagnosing, however accurate a situational model may be, adequate modeling of a real - life situation is virtually impossible. Therefore, a decision-maker has the final say and has to bear responsibility.

The topics discussed in a specific subject include consideration and comprehension of typical finite situations, with simulation models to be developed for them.

Therefore, there are two related tasks in terms of training and professional advancement of economic experts: firstly, a uniform software package of an electronic trainer has to be developed and secondly, a software package for development of simulators has to be made up.

The first task consists of two related sub-tasks: compilation of a hypertext-based e-manual and creation of a software environment for distance solving of problems in an interactive mode. Theoretical and practical aspects of compilation of hypertext-based e-manuals have been widely discussed in the professional literature. Some simple editing software are available by means of which, a trained professor of economics can compile an e- manual. A number of them containing texts, graphics and videos are available nowadays. After familiarization with the material in them, one should get over to some hands-on work, such as solving tasks, discussion and analysis of theoretical issues etc. and that's what the trainer software is helpful in.

For economic subjects, we developed operational and strategic management (Prof. Badri Ramishvili) included in the curriculum since 2013, financial functions in Excel (Prof. T. Munjishvili), a trainer (a manual and a trainer software [6-10]. The training is conducted by “Cyber 1” software package. [11]. Consideration of its operational strengths and weaknesses led to creation of "Cyber 2T" trainer software allowing:

1. an instructor to formulate a typical training assignment by subjects, topics and sub-topics;

2. prior to the training, a student:
 - selection of a training language (Georgian, English, Russian, Ukrainian etc.);
 - formulation of an individual task on the grounds of a typical assignment;
 - definition of the training time ;
 - according to the assignment, probabilistic arrangement and selection of the tests or performance of a training in the order specified in the assignment;
 - changing the training trajectory according to the student’s answers;
3. diagnosis of mistakes and showing the ways to prevent them;
4. introduction of the concept of complexity of the assignment topics and sub-topics;
5. textual, graphic, video or combined subject or test-specific aids;
6. working on the open or closed tests;
7. setting a task by way of textual or graphic or video or textual and graphic or textual and video information;
8. in the closed tests, availability of at most three correct answers out of maximum seven options;
9. giving answers only upon marking the necessary number of correct answers and giving the “answer” order;
10. availability of any number of answers in the open tests;
11. marking the $q_i \in Q$ score for the $\forall n_i, n_i \in N$ answer. The score may be an integer or a decimal positive number;
12. use of words, numbers, a sentence or a combination thereof, as well as an abbreviation in an open test;
13. comprehension of an unsynchronized statement or in case of addition of words;
14. writing words used in a statement or generally answers in any case or using wrong spelling;
15. identification of the actual answers to the tasks depicting subjects, topics, sub-topics with regard to the reference value (standard meaning) thereof;
16. journaling the training proceedings upon its completion;
17. in the training, showing various diagnostic notices; e.g. in case of use of an unknown word or omission of words, numbers etc.
18. continuation of a test suspended for a technical etc. reason from the breakpoint.

G is the in advance known finite set. Elements of the set are natural language sentences. Number of words from $g_{i,\lambda}$, of dictionary L , used in $g_{i,\lambda} \in G$, are depended on subjects put in exam and on the sentences which are used in open answers of this subject tests. Every element of $g_{i,\lambda} \in G$ are different at least with one word.

$$\forall g_{i,\lambda} (g_{i,\lambda} \in G) \wedge g_{i_0} (g_{i,\lambda} \in G) \Rightarrow g_{i_0,\lambda} \setminus (g_{i_0,\lambda} \cap g_{i,\gamma}) \neq \otimes \wedge g_{i,\lambda} \setminus (g_{i_0,\gamma} \cap g_{i,\lambda}) \neq \otimes$$

Every pair can be consisted of words same by content.

$$\langle g_{i_0,\lambda}, g_{i,\lambda} \rangle g_{i_0,\lambda} \subset G, g_{i,\lambda} \subset G$$

$$\exists \forall g_{i,\lambda} (g_{i,\lambda} \in G) \equiv g_{i_0,\lambda} (g_{i_0,\gamma} \subset g_{i,\gamma}) \quad [1]$$

Here sign \equiv means that, two, $\langle g_{i_0,\lambda}, g_{i,\lambda} \rangle$ sentences are equal by content.

In the system of knowledge revealing and rating “Cyber-2T”, for any answers, phrases, of each tests is relevant to $g_{i,\lambda} \in G$ sentence. Desired result can be reached, if $g_{i,\lambda}$ will be discussed as a product, and words $a_i \in L$ included in it as a condition. In this case, “Semantic analysis” will be reduced to searching of productive system, dictionary organization and relevant productions of received facts. Actually, particular production is selected, because we discuss particular answer with known meaning. It is needed to find out relevance of received facts (words) to existed facts. So:

Is given: non-empty set of predicates, natural language words of open tests in given subjects $\{L = \{a_k\} \neq \emptyset, k = 1 \dots n$, non-empty set of actions $K = \{k_{j_0} (a_{k_{j_0}})\} j_0 = 1 \dots m$, and non-empty set of informativeness $K = \{k_{j_0} (a_{k_{j_0}})\} j_0 = 1 \dots m$. Where, elements of the set $m \in N$ are scalar functions on G and using them is measured some parameters with defined scalar. Every criteria of the informativeness has some weight h_0 in way, that

$$h_0 \in Z, \sum_{\alpha}^{\beta} h_{\alpha} = 1. \quad [2]$$

Conditions of using a trainer:

1. Regular operation of computers, computer network, server and software. It's a must;
2. Discussion of the syllabus topics and sub-topics by an instructor, setting up a test (task)-base according to the e-manual;
3. Creation of a comprehensive textual, graphic, video aid to the tests;
4. Periodic information updating in the test aid base, adding up new ones and modification of those available;

“Cyber 2T” is multilingual. Various subjects may be presented in several languages.

Here we'll focus on conditions 1-4. For a topic, an instructor makes up a typical assignment specifying the training language, number of the topic/sub-topic, name, test numbers, including those to be used in the training, test type (closed /open), total number of questions for the closed tests, including the number of right answers, kind of appraisal (percentage /non-percentage), maximal score for the right answers in the open or closed tests, number of the right answers in the open test. Before the test, at a student's order the following table shows up:

Here the student can change the training time, appraisal (percentage /non-percentage), number of the training tests, maximal score or the training language. For instance: if a student doesn't want 21 topic tests to be used in the training, he will write 0 in the relevant space. He can select any number of topics from those offered.

With “Cyber 2T”, a subject is taught in the order below:

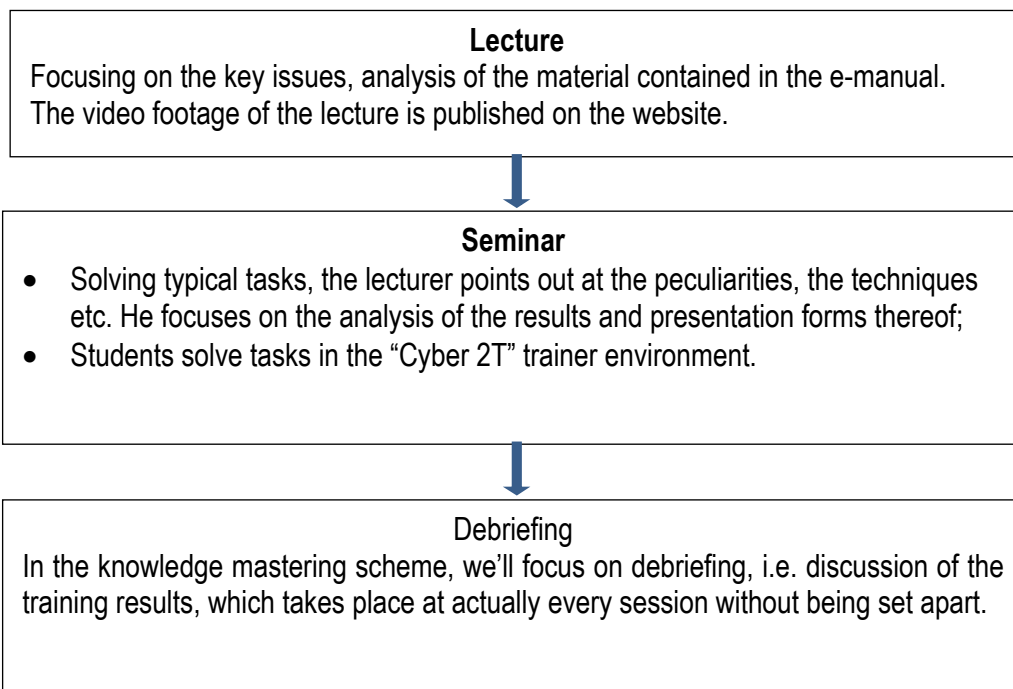


Figure1. Educational process

The screenshot shows a web browser window with the URL `old.press.tsu.ge/GEC/internet/internetgak/EXCELL_NAW3/Mtavari.html`. At the top, there is a navigation bar with 21 numbered buttons (1-21) and two buttons labeled 'მაგალითები' and 'ტრენინგები'. Below this is a section titled 'თავი 2. მონაცემების მიღება' (Chapter 2. Data Acquisition) with a sub-heading 'გარე მონაცემების მიღება - ვიდეო' (External Data Acquisition - Video). A red circle highlights a 'სარჩენი' (Download) button. An arrow points from the text 'EXAMPLE' to this button, and another arrow points from 'download free' to the same button. The main content area contains text about Office-ს დანართებს (Office add-ins) and lists three tasks. Below the text is a section titled 'Excel -დან მონაცემების გადართვა Word -ში' (Exporting data from Excel to Word) with two bullet points. At the bottom, there are two Excel spreadsheets side-by-side. The left spreadsheet has columns A, B, C, D and rows 1-6. The right spreadsheet has columns A, B, C, D and rows 1-6. The data in the spreadsheets is as follows:

წლები	საბალანსო ღირებულება	ამორტიზაცია	ნარჩენი ღირებულება
2000	5000,00	750,00	4250,00
2001	2500,00	637,50	3612,50
2002	3612,50	541,88	3070,63
2003	3070,63	460,59	2610,03

Pic.2. Example online course "EXCEL"

Conclusion

In working with a trainer, the students' mistakes appear on the lecturer's computer screen as the training protocol, which the lecturer analyses and after the training discusses the results (debriefing). The debriefing is an informal procedure, in his publication [A.A. Svistunov] /2/ details its tasks and goals, focusing on the lecturer's (leader of the debriefing) role. He states that it is the leader's task to create a creative atmosphere, adding that emphasizing a student's mistake is unacceptable. Instead, the lecturer should describe the mistake as the one made by the group so that all the students could express their views about it. Such an approach is conducive brainstorming, search for better solutions to tasks etc. The requirements to the debriefing leader depicted in /2/ are not new. They are detailed in the intellectual process regulation method - the study /12/ in which the psychoneurotic programming method is set out.

In preparing the subject trainer materials and making changes to them, the lecturer will take the students' views and proposals into account.

From 2016-2017 academic years Financial Analysis is going to be taught by 'Cyber 2T' trainer we have developed. The instruction at the National Commerce University in Kiev, the Tbilisi Iv., Javakhishvili State University and D. Robakidze University, Tbilisi will be in the Georgian, Ukrainian and English languages.

Given the trainer specifics, "Cyber 2T" is the modification /13/ of the "Cyber 2", the software package for presentation and assessment of knowledge that we developed. It was written on VB.NET 2010, the data base is on SQL Server 2008.

Bibliography

1. А.В. Трухин, Анализ существующих в РФ тренажерно-обучающих систем, <http://ido.tsu.ru/files/pub2008/8.pdf>
2. Свистунов Андрей Алексеевич. Методы и принципы симуляционного обучения, http://rosomed.ru/kniga/metodi_i_principi_simulationnogo_obucheniya.pdf
3. www.qumcpo.minsk.edu.by/ru/main.aspx?quid=1761
4. Ельцин, Андрей Владимирович, Гипертекстовые тренажеры для обучения по экономическим дисциплинам. Тема диссертации и автореферата по ВАК 08.00.13, кандидат экономических наук, <http://www.dissercat.com/content/gipertekstovye-trenazhery-dlya-obucheniya-po-ekonomicheskim-distsiplinam#ixzz439UL0S43>
5. Рышкевич В. М. Симуляционные формы обучения в практике преподавания экономических дисциплин и повышения квалификации [Текст] // Теория и практика образования в

- современном мире: материалы III междунар. науч. конф. (Г. Санкт-Петербург, май 2013 г.). - СПб. : Реноме, 2013. - С. 162-163. <http://www.moluch.ru/conf/ped/archive/70/3864/>
6. Tea Munjishvili, Zurab Munjishvili, Excel 2010 interactive exercises and tasks, Part I. 2013. TSU. <http://old.press.tsu.ge/GEO/internet/internetgak/ELSAXELMZRVAELO/mtavari%20sarcevi.html>
7. Tea Munjishvili, Zurab Munjishvili, Excel 2010 interactive exercises and tasks, part II. 2013. TSU. http://old.press.tsu.ge/GEO/internet/internetgak/EXCELI_NAW2/index.html
8. Tea Munjishvili, Zurab Munjishvili, Excel 2010 interactive exercises and tasks, part III. 2013. TSU. http://old.press.tsu.ge/GEO/internet/internetgak/EXCELI_NAW3/index.html
9. Badri Ramishvili, operational management, <http://old.press.tsu.ge/GEO/internet/internetgak/MENEJMENTI/index.html>. 2013. TSU.
10. Badri Ramishvili, Strategic Management, <http://old.press.tsu.ge/GEO/internet/internetgak/STRATEGIULI/index.html>. 2013. TSU.
11. Tea Munjishvili, Zurab Munjishvili, Knowledge demonstration and assessment system "Cyber1", international Journal "Information Technologies & Knowledge" Volume 8, Number 3, 2014, pp. 271-279.
12. Проблемы управления интеллектуальной деятельностью - Психозвристическое программирование. Сб. под редакцией академика АН ГССР В. В. Чавчанидзе. Изд-во «Мецниереба», Тб., 1974 367с.
13. Thea Munjishvili, Zurab Munjishvili. "The system of Discovery and Estimation of Knowledge" Cyber2 "", Scholars' Press, Saarbrücken HRB 18918. Published on: 2015-01-15 Number of pages: 108. Book language: English. ISBN-13: 978-3-639-76094-1

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