Using An Electronic Book In Distance Education

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In scope of project "Phare Multi - Country Programme for Distance Education" in years 1997/98 and 1998/99 we formed more learning material for the need of our new Distance learning centre. The reason for forming this kind of learning material was that we became aware that new forms and methods of distance learning have to assure the bigger independence of students in the whole learning process. For achieving these aims smaller groups of students with high individualisation are appropriate what brings increased level of activities in the whole learning process and enables periodic information and more realistic knowledge control. In this article we present some experience we had by by forming electronic book for subject Office automation and some students opinion about studying with help of electronic book.

1 Introduction

Distance education is a very suitable form of an education for a modern man. It offers the possibility of studying at home or in virtual classroom. There is no time pressure, man can study at the time which is most appropriate for him. During the process of designing and producing electronic book for distance education purposes we have to consider several different aspects, like:

- distance education is a unique learning process with its own rules within the frame of general didactic rules (Keegan 1991, Van der Brande 1993);
- modern technology (TV, computers and communication equipment) make distance education possible (Laurillard, 1993);
- distance education demands more initiative and participation by students in the educational process; this kind of study offers a higher level of student activity (Boud, 1992); feedback information and more control of knowledge [Rowntree, 1992);
- a learning module can be offered to students with suitable material for self-education (books, programmed material, audio and video cassettes, diskettes with computer supported learning program, etc.) (Laurillard, 1993, Rowntree, 1991);
- many students already have audio and video recorders and computers, which provides the basic technology for distance education (Batagelj & Rajkovic, Dhanarajam 1994, Jereb 1992);
- with adequate telecommunication equipment, students can work on a central computer from home or on a terminal in a classroom;

2 Forming of an electronic book

In continuation of the article we will describe basic steps of designing of an electronic book. We have to stress that the described methodology represents only a methodological framework of electronic book design, which helps the author in developing process.

2.1 Analysis of study plan

The data, contained in the study plan for a subject, present the basic starting-point for the organising of study process. The teacher must include in the educational process also the results of his research work. The goals, nature and structure of the study material describe the forms and methods of the study process and also direct and indirect study sources.

2.2 Study plan articulation

We can divide the whole process of study plan articulation in three basic steps:
- articulation of the study plan into study units
- didactical articulation of single study units
- time articulation of single study units

In accordance with previous by mentioned basic steps the appropriate study plan articulation - also in distance education and designing of an electronic book - has to answer these questions:

- how many planned hours can we realise with the electronic book help   and how many with other appropriate electronic media or knowledge sources help?
- what kind of media (hardware and software) do students need for studying with electronic book?
- what kind of instruments for self evaluation will be available?

From theoretical point of view the documented study plan articulation gives us all data for the preparation of all needed study sources for direct and indirect realisation of the study subjects.

2.3   Preparing of electronic book

2.3.1   Text editing

In the writing and editing phase it is suitable to take in consideration some results of the previous research.
- the content has to meet the logics of study material;
- text has to be clear and understandable and index of used words is very welcome;
- the size of electronic book, which includes also other forms of information (sound, picture, animation, video), is smaller than the size of classical textbook; if there is a need we can direct students to secondary knowledge sources in WWW environment;
- choosing of appropriate font size and type assist to clearness of study material, it also stresses different ideas, conceptions and rules;
- in web environment we have to use all advantages of HTML;
- the content of logical rounded parts must contain also questions for self assessment and exercises which direct students to solve the essential problems and form their mentality;
- the content has to be organised for computer usage that it can   give the material in any kind of time tempo and sequence.

2.3.2   Sound and graphic editing

In the process of sound and graphic editing we have to consider these empirical findings:
- pictures, graphs, tables, spreadsheets and diagrams in electronic book play an important instrument for getting students attention;
- using of didactical formed cartoons is more effective than using of very realistic pictures;
- the pie charts are more suitable for representation of percent values than histograms, and histograms are more suitable than linear graphs;
- the clear and readable legend near any graph is very important;

- in the examples where for transfer of knowledge the audio representation is enough we include the sound files in the electronic book; if we need the audiovisual representation we use sound and animation;
- when we use different kinds of media we have to take in consideration the availability of different hardware and software and the qualification of the student to use them;
- beside recording equipment, hardware and software we need also a lot of knowledge and experiences to produce the multimedia electronic book;
- there is a luck of professional digital audio and video study products on our market;

2.3.3   Instruments for self assessment

The electronic book should contain also suitable tests for self assessment at the beginning, in the middle and at the end of the studying process. As for how the exercises are constructed and how students answer questions we can divide exercises in two groups: exercises where student write down adequate answer and exercises where student choose the correct answer. We can write down several general findings according to preparing self assessment questionnaires:
- exercises where students write down answers are very seldom used in electronic books because of the problem how to tell computer which answer is correct;
- short write down answers are more applicable but we still have problems of quite a big number of the correct answers (capitalisation, abbreviation, etc);
- most suitable type of questions are multi-choice questions;
- the questions have to be in order from easiest to most difficult ones;
- people involved in preparing self assessment questionnaires have to know a lot about the theory of assessment;

3   Advantages of an electronic book

The structure of an electronic book is very similar to a classical textbook. The contents in electronic book is also divided in chapters and subchapters. Subchapters discuss small rounded subject (material) so we can say that subchapters present study modules. The advantages of electronic books are:
- electronic book can be built up step by step (module by module);
- content can be actualised from time to time;
- with the appropriate form we can achieve the structure of programmed book (information, questions and exercise, feed-back information);

- with the appropriate form we can combine levels of the study process (introducing, working with new contents, repetition, exercise, verifying);
- there is only essential information on the screen and the user can use it when he needs it (individualisation of tempo, path and mode of study).

4   The electronic book

The electronic book and knowledge tests were designed with help of GUIDE 3.1 hypermedia software The first version, which was designed for individual study on PC, was also re-formed into HTML form for use on the world wide web.

The experimentally tested electronic book was designed for office technology comprehension and is used by subject Office automation. Working with the electronic book is not difficult. Students can choose their own sequence of learning subjects and simultaneously check the acquired knowledge of each chapter. All questions are also gathered in an extra part in the electronic book so those students can test themselves at the end of the learning process. The only difference between checking the knowledge simultaneously and testing it at the end is that students by checking their knowledge simultaneously get the feedback information about their success. By final testing students get only the number of correct and wrong answers and a percentage score. The difference between an electronic and a classic book is that the electronic book does not only mediate the information but it also tells the student if she or he understood the information. The electronic book tells the student weather hers or his answer was correct or not. Figure 1 shows an example of the electronic book screen used for chapter: Office machines and devices.

5   Student's opinion about using the electronic book

Students' opinions about individual learning with help of the electronic book were gathered with help of adequate opinion scale. The scale was divided into five basic parts representing five views (elements) of studying process:

- motivation
- methodology
- pretentiousness
- presentation and material organisation quality
- learning contest.

Each part includes eight statements so the opinion scale has 40 different statements.

The opinion scale was expressed with 4 categories:

- I fully agree
- I partly agree
- I partly do not agree
- I do not agree at all.

So at the end we had a questionnaire with 40 questions or statements where 20 of them expressed a positive point of view and 20 a negative point of view.

The inquiry was carried out among the students of second and third class of Faculty of Organisational Sciences in year 1994/95, 1995/96 and 1996/97. In these three years data from 133 students were collected. The students' response was satisfactory - we could say above expected. The inquiry was always done at the end of the education process, when lectures, exercises and individual study with help of the electronic book were finished. The inquiry was anonymous.
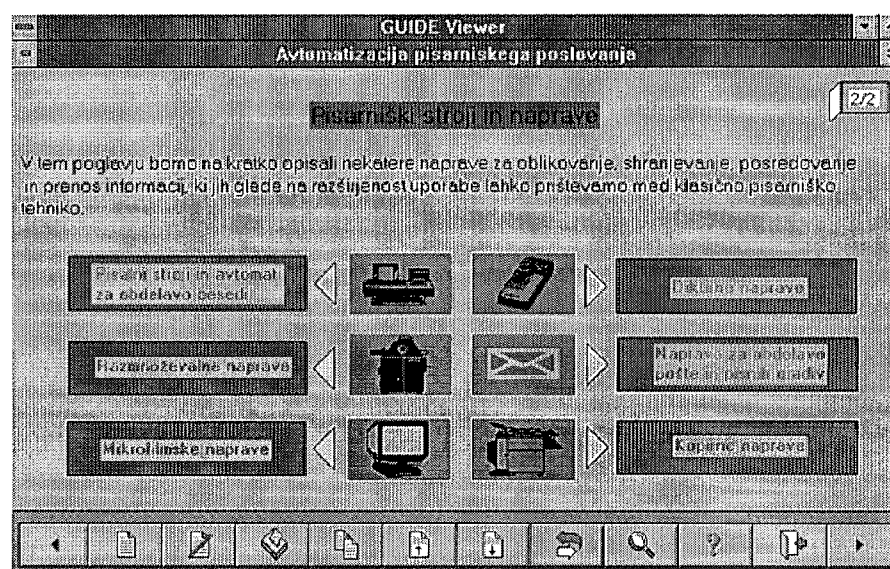

Figure 1: Example of electronic book screen

At the end of our inquiry we reckoned up the arithmetic means of answers for each statement so that we could see weather the students had a positive or a negative relation to the specific statement and so to the specific element of studying process. The results of inquiry are shortly described below:

- Students were satisfied with a new way of study, they meant that the learning quality was grooving by using the electronic book.

- They said that the chapter separation in the electronic book was good and that all parts were well linked.

- Opinions about the learning speed were divided.

- Students' opinion weather concrete examples contribute to better understanding of material or not were also divided.

- Students were satisfied with the contents of the electronic book and they meant that the extent of the learning material is appropriate.

- They showed a positive statement about methodological point of view of the electronic book.

- Students were satisfied with the pretentiousness of the electronic book, with the systematic work, with learning goals and with the acquired knowledge.

- They could not tell weather the learning material mediates only facts or not. These could be the consequence of not knowing the learning material in full. Maybe the answers would have been different if the inquiry had been curried out after the final exam, when the students would have been more acquainted with learning material, and not immediately after the first work with the electronic book.

6 Conclusion

In the article the use of an electronic book as a new method of distance learning is represented. The results of the research, which was carried out among the students of Faculty of Organisational Sciences who were using an electronic book by their study, are shown. Students are satisfied with this kind of study and are looking forward to using electronic books for other subjects as well. The use of an electronic book variegates the study and increases the individual work and motivation of students. The positive experiences of using an electronic book are pointing out that the introducing of distance learning would probably also have a good response among the students.

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