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## **E-learning in arithmetic courses delivered in the combined form of study for primary school teachers**

**Abstract.** E-learning of teaching arithmetic designed for future primary schools teachers — a combined form of study Implementation of e-learning in the distant course for future primary schools teachers based on the arithmetic course delivered in the second year of study. Development of the subject matter for each training module, conversion of textbooks into electronic format. Motivation components. Development of tests providing the necessary feedback, development of final tests. On-line and off-line education, its possibilities, utilization and combination.

The issue of distant and combined studies is widely discussed in connection with the long-life learning designed for adults.

This does not necessarily apply only to universities but also to other institutions involved in education of the adult population. The age of students does not play an important role in this type of study but what matters is their interest and pro-active approach to the study.

As the interest in these forms of study increases, the course organizers very often ask themselves the following questions:

1. Where to find sufficient human resources to support the combined study?
2. How to arrange the facilities for teaching?
3. Who will develop and fund textbooks for combined studies?

There are many other questions but those listed are the most important ones. The possible solution can be e-learning. What exactly is understood by e-learning? Is there any definition of this teaching tool?

The notion of e-learning (electronic learning) has not been defined yet. It can be understood as an on-line teaching process. Sometimes it is interpreted as a computer based teaching and learning process as e-learning courses can also be available on CDs and DVDs.

The initial costs of e-learning implementation are a bit higher. It is necessary to procure the hardware and software used in e-learning: software application, sufficiently fast network connection, students must have an access to a computer linked to the Internet.

There are two questions to be asked in connection with the implementation of e-learning:

Are we ready for e-learning?

What are the key factors in this readiness?

- Psychological readiness of participants (students' attitudes);
- Sociological readiness (inter-personal relations in the group);
- Readiness of the external environment (accessibility, diversity of students etc.);
- Human resources availability (availability of teachers and trainers);
- Availability of funds;
- Technical readiness (IT skills of students);
- Availability of the equipment (availability of HW, possibility of leasing);
- Readiness of courses (contents of courses).

It can be stated that there are many e-learning opportunities available through the Internet. It starts from simple on-line courses up to virtual studies at reputable universities. There are virtual schools such as [www.executrain.com](http://www.executrain.com) and [www.click2learn.com](http://www.click2learn.com).

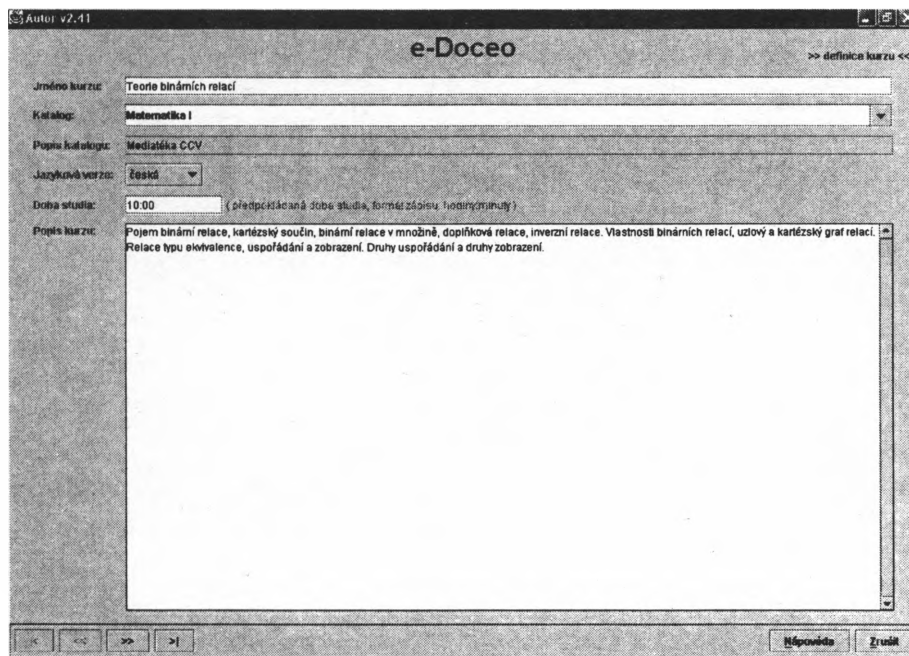
In the Czech Republic there are off-line courses available on CDs and focused on information technology and other subjects. However, the offer of appropriate portals is still very limited. The best known are [www.edoceo.cz](http://www.edoceo.cz) developed by Trask, which are based on e-Doceo application and then [www.e-learn.cz](http://www.e-learn.cz) developed by Kontis.

At the Teacher College of UJEP we must deal with the same issues outlined in the introduction of this paper. Therefore we currently consider the offer of Trask to use their e-Doceo application for students of the combined courses who could be taught through e-learning.

First we decided to test in which areas we could apply e-learning. We chose "Theory of Binary Relations" from the textbook for math teachers for primary schools written by Miroslav Bělík.

The subject matter in this textbook is structured, every section consists of a motivation task, in which new notions, exercises demonstrating relevant procedures, and exercises for students to practice are introduced. This structure provides a good basis for linear programming of the subject matter in e-Doceo application. (This application also allows the course program to be more branched).

In the development of the course on “Theory of Binary Relations” it was necessary to specify the name of the course, catalogue, catalogue description, language, period of the course, and course description (Fig. 1).



**Figure 1.**

Next screen presents the name of the author of the original textbook, the author of its electronic format, the owner and the web site address of the organization, and course number.

These introductory screens are followed by a presentation where the screens are displayed one by one in the process of study based on this application. It is possible to enter text, voice, pictures and video into the screens (Fig. 2 and Fig. 3).

Tests can be generated separately and they provide the option either to combine questions with answers or tasks with results. From the menu we can choose the relevant option which suits the type of the exercise best. At the same time we can select the number of points to be awarded for the correct answer (Fig. 4 and Fig. 5).

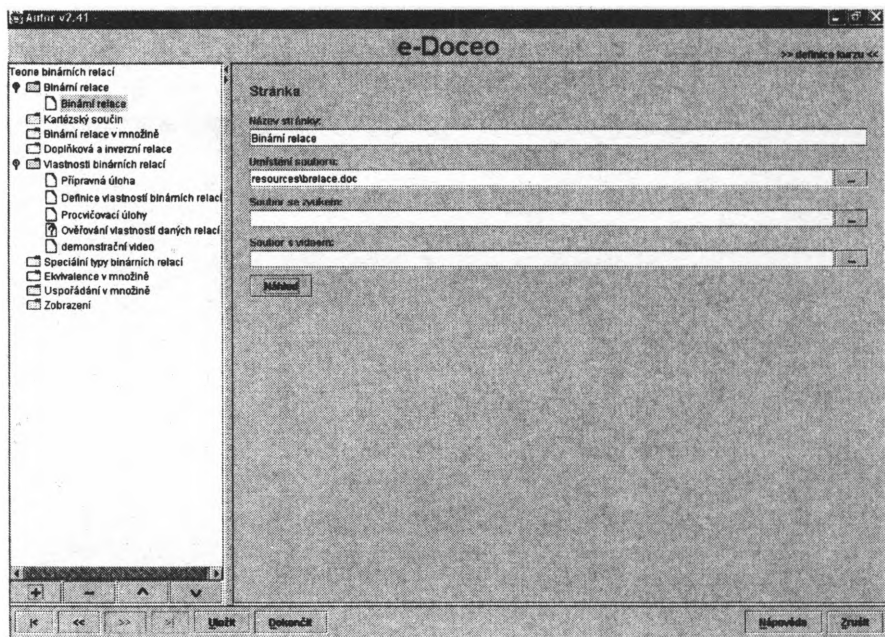


Figure 2.

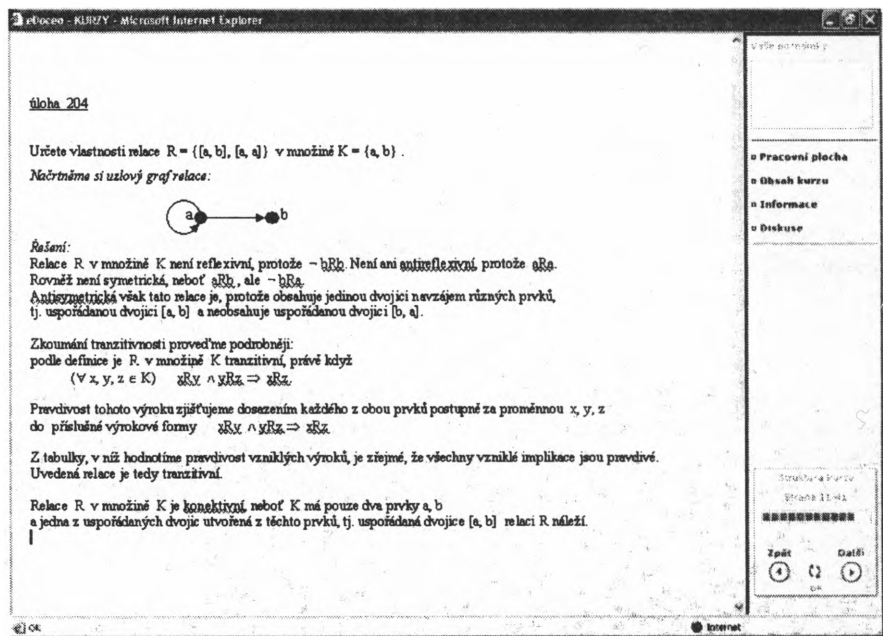


Figure 3. An example of the application for arithmetic.

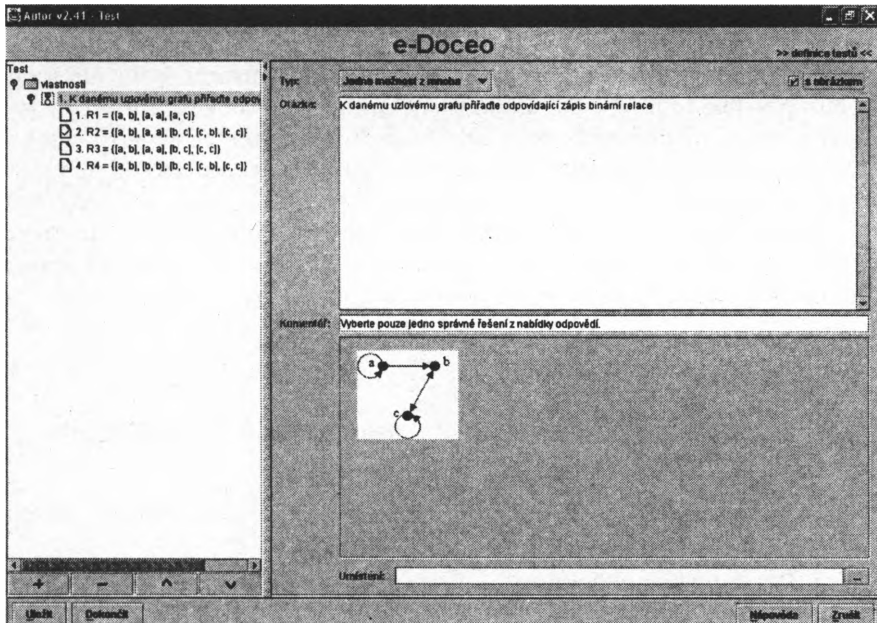


Figure 4.

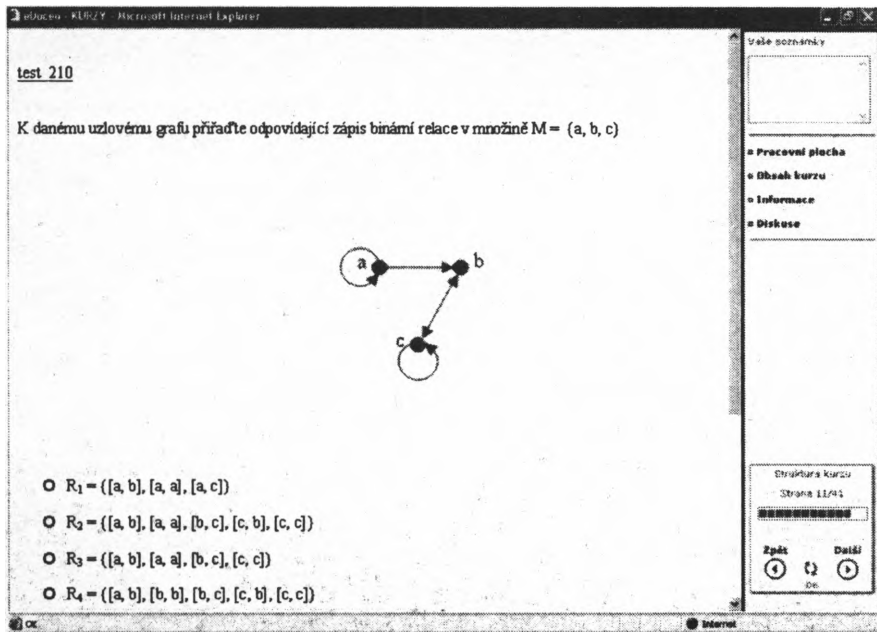


Figure 5.

The work with e-learning courses of e-Doceo is very simple (forwards and backwards, percentage, rate of success in the course, back to start, ticking the answers in a test); in addition to limited options in answering the questions, it is also possible to have general questions, which the students answer by typing their own words into relevant windows. It is a bit cumbersome to enter data into the “developer” application as some actions, particularly in the system, are less conventional.

Finally, there is one more important point to be mentioned. In order an e-learning course to be efficient and successful it must be developed jointly by the teacher and the developer of the electronic format.

### References

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