2nd Bosnia and Herzegovina Seminar in Education

Wednesday, July 26, 2005
CRICED – University of Tsukuba

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COURSE: Promotion of Information, Communication And Technology (ICT) Education and Developing Environment for e-learning in Informatics and Mathematics at Elementary and Secondary Levels for Bosnia and Herzegovina

DURATION: November 30, 2005 – August 19, 2006

PART I: ICT LEARNING

The term, Information and Communication Technologies (ICT), refers to forms of technology that are used to transmit, store, create, share or exchange information.

In other words, ICT are the computing and communications facilities and features that variously support teaching, learning and a range of activities in education.

Examples of ICT include: radio, television, video, DVD, telephone, satellite systems, computer and network hardware and software, as well as the services associated with them, such as videoconferencing and electronic mail.

PART I: ICT LEARNING

The effective use of ICT can improve education quality, expand learning opportunities and make education more accessible.

Using ICT can help pupils to:
- ✓ experiment and learn from feedback;
- ✓ think logically and develop problem-solving skills;
- ✓ observe, explore and explain patterns in number, shape and data;
- ✓ make and test hypotheses and predictions, which can be based on large amounts of data;
- ✓ make generalizations that can be based on experimental evidence;
- ✓ develop mathematical vocabulary and language.

PART I: ICT LEARNING

The most important aspect of ICT Learning is not the access to information, but the **ability to customize** learning approaches **to match** student's learning styles – pacing the learning approach, speed, and depth to reflect student's prior knowledge, level of comprehension, and areas of interest.

There are few aspects of ICT Learning that are superior to classroom instruction:
- ✓ **adaptability;**
- ✓ **exploratory activity;**
- ✓ **dynamic representation;**
- ✓ **feedback from the environment;**
- ✓**access to the best educators in the world**.

PART I: ICT LEARNING in Mathematical Education

Possibilities of ICT learning in Mathematical education have large range in classroom teaching as well as in individual learning.

Teachers should select or create mathematical tasks that take advantage of what ICT can do efficiently and well - graphing, producing dynamic images, computing and providing access to data.

PART II: My content – Complex numbers

MATEMATIKA ONLINE

PART III: THE TEACHING EXPERIMENTS

The teaching experiments are carried out in Gymnasium Mostar, secondary school in Bosnia and Herzegovina. The subject of the teaching experiments was multiplication of the complex numbers.

The teaching experiments are organized by Ms. Valentina Mindoljević, professor of mathematics and physics in Gymnasium Mostar and previous JICA trainee. She was able to organize two classes at her school.

The first class was done in the equipped classroom with 15 students of the second grade. They studied complex numbers at the beginning of school year (September – October 2005) and already have knowledge in it so this was a review lesson. The second class was done with the first grade students. That was new contents for them (they are supposed to learn it in September this year, At the beginning of the second year).

PART III: THE TEACHING EXPERIMENTS – RESULTS

Class with 2nd grade students:

✓ Lessons are very understandable and is easy to follow them;
✓ Most of the exercises are easy to understand. They found some difficulties in exercises with complex plane, and with exercises where is necessary to write an answer in the form of words;
✓ All the students agreed that the most interesting are interactive contents – because they get instant result and feedback from the computer. They lost attention on working sheets with many exercises, because they had to do them on additional paper and they were very alike;
✓ They suggested that it should be clearer what should be written answer in the fields where «word form» answer is needed. Another suggestion is to have more different exercises on working sheet because they found it tiring doing many of same sort;
✓ Contents are very good structured, but it was not possible to determine how much they could learn as they had already done it in the school. But they found it amusing and expressed wish to have more such contents in our language.

PART III: THE TEACHING EXPERIMENTS – RESULTS

Class with 1st grade students:

✓ The textual part did some problems. Out of it they understood only the powers of imaginary unit. I realized that the **definition of algebaric form of complex number** is missing there, so when they did interactive lesson they were confused about what (x + yi) is. There's too much text in the lessons so most of them didn't have concentration to read it till the end;
✓ Interactive part did go well, as they did only multiplication. Also after that there were no problems doing exercises.

FUTURE ACTIVITIES

✓ Continue to make contents;
✓ Promote the project among teachers, colegues and students in Bosnia and Herzegovina;
✓ Cooperate with the future & ex participants;
✓ Organize activities in some schools introducing ICT learning.

AIMS

✓ The main obstacle in implementing completely this project is not having equipped classrooms and ITC tools in the schools in Bosnia (i.e. projector) so one of the main aims is to promote the project among people who could help improving conditions;
✓ Work on the education of teachers, because very soon if we want to follow the world education trends every teacher should be able to prepare and plan lesson using ICT;
✓ Broaden the communication should make Mathematics education a dynamic and challenging field both for students and teachers.

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