Modern Aspects of Communication In Education of Teachers Using New Information And Communication Technologies (ICT)

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Abstract: This work deals with the need of introducing modern aspects of communication on higher education of future teachers using information and communication technologies. The emphasis is put on the importance for future teachers to have basic information science knowledge and skills and their preparations for using ICT. A growth of the number of computers in education in Croatia has been shown for the period between 1999 and 2003, as well as a proposal of basic contents which, within the informatical and informational system of education, every person included in the education system should possess. Contents are indicated of the Basic Course IT knowledge, The Advanced and the specialist Course of Computer Literacy. suggested by the Ministry of Science, Education and Sports of the Republic of Croatia. A Curriculum of intensive study of Information Science is presented as it is realized in one of the nine teacher's training colleges in the Republic of Croatia.

KEY WORDS: Informational and communication technologies (ICT), teachers, education, information science knowledge and skills.

Introduction

Informatical and informational education is based on application of modern information and communication technologies and it represents a new form of communication in education of teachers. The modern information science technology has been changing the requirements related to the past (outdated) conception of education and forms of communication in it. The education process becomes informational and communication process, while education becomes multimedial. Teachers are not limited any more to use only the blackboard and the chalk, but their possibilities are spread in an unlimited, virtual and technological world. The feature of the new type education in future teachers is directed to the constant following of innovations, whole-life studying and best application of new forms of communication and new content in curricula.

Today information and communication technologies play an important role in the process of education of teachers because they enable educators to acquire new competence. "Till the appearance of computers, educational technology was limited to audio-visual devices and learning through television, which intensified even more the teacher's activity and children's passiveness." (Negrpoponte, 2002). Today the student is in the very centre of the curriculum, while the teacher is in the role of s mentor and advisor. If we want tuition to be held according to the modern education concept, taking into consideration the children's rights, wishes, needs and interests, then it is very important that all the teachers have basic informatical and informational knowledge, that they follow new trends so

that they could improve the curriculum and their own practice, and at the same time to offer students high-quality education and prepare them to use new technologies and whole-life learning.

Croatia is a candidate for entering the European Union, thus the aspiration for entering an elite society of knowledge has brought to intensified activities in the field of elaboration of various suggestions of development containing technological development of Croatia. The reform of higher education system of Croatia and acceptance of guidelines of Bologna Declaration by introducing the new way of credit points ECTS (European credit transfer system) are prerequisites for entering the European Union and European system of higher education. All the countries members of the EU support the use of information an communication technologies in all areas, and particularly in the field of education.

USE OF NEW COMMUNICATION TECHNOLOGIES IN EDUCATION

Information and communication technologies have offered a series of possibilities of new forms of communication in the education system. Education about ICT represents a basic skill of individual learning and intellectual growth of each individual, and particularly collaboration and communication with other factors of the education process. ICT facilitate activities in the context of whole-life learning at they contribute to the individual and social integration as well as personal development if an individual.
The development of communication competence of teachers by means of new technologies therefore represents an essential condition of their education.
Unfortunately, the majority of schools in Croatia haven't got enough computers, the equipment is outdated thus making impossible good work and communication with the students. The Ministry of Science, Education and Sports of the Republic of Croatia has been investing funds for equipping primary and secondary schools with computers, however, these funds are still insufficient.

According to the statistical figures of the Ministry of Science, Education and Sports of the Republic of Croatia the number of computers in primary and secondary schools in 1999 was 12,323 while in 2003 this number was 24,000. The number of students on one computer in 2003 amounted to 28.5 in primary schools, and 16.91 in secondary schools. In 1999 there were 161 computer rooms connected to the network in primary and secondary schools, while in 2003 there were 1072. We can say that we have not reached ideal conditions of work yet in which every student should have his own computer. Today two or more students have to share the same computer which makes following of contents inadequate as well as practical solution of the tasks.

In primary schools of Croatia the school subject Informatics has not entered yet the ordinary curriculum, but it is realized as an elective subject or as an extracurricular activity. The majority of older teachers teach obsolete informatical contents which result in greater passiveness of students. In secondary schools the subject Informatics is compulsory, and the attention of students is directed to acquiring basic informatical knowledge and skills. For students who want to learn more, Informatics as an elective subject is arranged. Unfortunately, the majority of secondary schools there are few programmers, and the students are left to various informatical courses for which they have to pay considerable sums of money.
Tendency of the Ministry of Science, Education and Sports of the Republic of Croatia is to introduce computer literacy to every teacher. Therefore, teachers can go through three levels of computer literacy: Basic, Advanced and Specialistic.

According to the extract from the project "A Proposal for Training Employees in Education Sector to Apply IT and Communication technologies", the framework of education contents for the Basic course would be 80 hours, for the Advanced course 94 hours ad for the Specialistic Course 162 hours – (The Ministry of Science, Education and Sports of the Republic of Croatia, 2004). The Basic Course if IT knowledge consists of the following curricula:

Curriculum	Lesson
Basics of Informatics	6
Operational Systems	12
Word Processing	18

Log & Chart Calculations	14
PC Presentations	8
Internet (e-mail, Web)	14
ICT in Training & Education	4
TOTAL	80

Table 1: The Basic Course of IT knowledge

Curriculum	Lesson
MS Office (Advanced)	36
Computer Labs Network	18
Integrated ICT into tuition	18
Internet (Advanced)	18
TOTAL	94

Table 2: The Advanced Course of computer literacy

Curriculum	Lesson
Programming	36
School IT System	18
Multimedia in tuition	18
Specific Software for Group Curricula	18
Programmes for Compilation of Curricula Units	18
Desk Editing – design of a school bulletin	18
Library & Info Centre	18
Networks and Communications	18
TOTAL	162

Table 3: The Specialistic Degree of IT knowledge

"The project provides for the employees (45,000 – 50,000 persons) to acquire informational knowledge and get a certificate by the end of 2006, and the term for finishing education will depend on the amount of financial means invested in the aspect of indispensable knowledge and skills. In the majority of European countries similar project are finished or they are near to be finished." (The Ministry of Science, Education and Sports of the Republic of Croatia, 2002).

EDUCATION OF FUTURE TEACHERS FOR THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) IN EDUCATION

Education of future teachers should be on the use of contemporary information and communication technologies in the teaching procedure, and particularly on building global communication competence which will reflect then to a successful realization of personal and relational goals. The study elaborated by Bolt and Crawford in 2000 shows that "using the Internet and education technologies in general, is worth as much as the teachers who is using them." (Castells, 2001).

The need of informatical personnel who would educate teachers in an interdisciplinary way is present in most European countries. Therefore, one of the significant problems which slow down informational education of teachers is exactly the question of personnel competency on certain levels of education." (Tatković, Ružić, 2003).
In Croatian schools the majority of informaticians are engineers without necessary methodic, didactical, pedagogical and psychological education, reflecting then the quality of tuition. Therefore, it is proper to say that if school is an institution from of important aspects of communication society, then communication through IT should be taught by experts educated on an interdisciplinary basis, capable of integrating knowledge of information end education sciences on an education entity.

The need for personnel educated on an interdisciplinary basis is clearly present, that's why it is interesting to analyze which profile of personnel is educated on several colleges (faculties) in the Republic of Croatia: for the profession of a Maths and Informatics teacher persons are educated at: the Faculty of Science of Zagreb and Split, Faculty of Philosophy of Rijeka, and Faculty of Education of Osijek. For the profession of a Pedagogy and Informatics teacher person are educated at the Faculty of Philosophy of Rijeka, for an Information Science teacher at the Faculty of Philosophy of Zagreb, and for the class teacher with Informatics as an intensive elective subject at the Teachers Education Academy of Zagreb and Teachers Training College of Pula and Čakovec.

Teaching about ICT as an indicator of quality education has resulted in the need for reconsidering the education curriculum of Informatics, standardizing national plans and programmes, stimulating motivation of students to learn informational contents, and reconsidering teacher's methods of teaching Informatics.
Teachers Training Colleges in the Republic of Croatia in their full-time programme include the course: Basic of Informatics, which future teachers can treat as the basic for future extensions of informatical and informational knowledge skills.
At Teachers Training Colleges in Croatia: Rijeka, Pula, Zagreb, Gospić, Zadar, Split, Petrinja, Čakovec, and Osijek, students of class teaching have compulsory course of Basics of Informatics, most frequently lasting 60 hours.
We think that all the persons included in the education process should be literate in terms of informatics and should acquire the following knowledge (Ružić, Mrvoš, 2003) in the field of Informatics which should be accessible to all education institutions (kindergartens, schools, open education institutions, etc.):

Adopt the basic notions deriving from:

Field of the Informatics, IT-Communication Technology, Operational System-Microsoft Windows XP Surroundings, Programmes for Text Processing (WordPad, MS WORD), Programmes for Log & Chart Calculations (Log Calculations) (MS Excel), The Basics of Internet, The Basics of Execution of Multimedia Presentations (MS PowerPoint).

Basic Notions

Basic Definitions of Computers, What Is the Purpose of Computers, What Are the Advantages of Computers, Basic Structure of a Computer, Hardware and Software, Basic Structures, Memory.

Microsoft Windows Xp

Starting Up the Windows, Usage of Keyboard and Mouse, A Survey of Applications (Explorer, Control Panel, Folders and Recycle Bin) and operating a number of applications at the same time, Exchange fo Data between applications, Use of Tools to provide PC Maintenance, Operating PCs Network.

Text Processing (Wordpad, Msword)

An appearance of a Window, Inserting Text into a Document, Tool Bar, Opening and Closing of a New Document, Saving a Document, Mode of Cacellation, The Use of functions Undo and Redo, Text Compilation, Copying and Transfer of Text, Levelling of Paragraphs, Printing, Tracing and Substitution of Texts, Forming Chart Lists, Headers and Footers, Numbering of pages, Page Formatting, Creation of Tables, Inserting pictures, symbols, charts, Word Art.

The Table Calculator (Ms Excel)

A notion of a notebook, lists, cells, The basic Type of Data, Entering Data into a Chart and Correcting Errors, Copying and Transfer of Data, Entering Formulas and Functions, Copying of Formulas (the Absolute and Relative Address), Rounding with the Function ROUND, Arrangement of the Chart Design, Creation of Graphic Displays of Data Contained in a Chart, Adjustment of Printers and printing Charts with Data.

Internet

The Basics of Operating Internet, World Wide Web (WWW), Modes of Searching on Internet, Operating electronica mail (e-mail).

Multimedia Presentations (Ms Power Point)

Slide Forms, Presentation Forms, Graphic forms, Slide Dynamics, Dynamics of Objects on a Slide, Installation of Speech and Sound Background, Installation of Links.

Several Teacher Training Colleges of Croatia offer future teachers a possibility to take an intensive course (supplementary course). Namely, the Teachers Training College of Pula, starting from the academic year 1999/2000, offered its future teachers a possibility to take an intensive course of INFORMATICS. Besides their basic profession, future teachers acquire competence for teaching Informatics in primary schools. The ratio between education and informatic content is 30:70 in favor of the basic class teaching profession.

"The basic purpose of the intensive study of Informatics is to give students an adequate level of theoretical and applicational knowledge and skills which will enable them to convey modern ideas and knowledge in the field of information science to their future primary school pupils. During the study the students are trained to teach Informatics, both theoretical and practical part, they gain informatical knowledge in order to use computers in practice and follow independently classes in the Informatics course at senior years of study; they get to know principles of operation of computer systems, designing, building and maintaining informational system." (Tatković, Ružić, 2003).
School lasts 8 semesters (3420 hours) and it is divided into:

- course of education science
- course of basic profession
- professional teaching methods
- intensive study of the elective (supplementary) course of Informatics

Tuition of intensive study of the elective course of INFORMATICS, consists of fifteen informational courses, in total 960 hours (lessons). The condition to be satisfied in order to use such contents is that the student – future teacher be a sufficiently educated to apply information technology as education program supports at such a level to apply it in a creative way in his future work in all stages of the teaching process, in all forms, and at all levels of communication.

During the four-year intensive study of Informatics, future teachers listen to the following courses:
Basic of Informatics I & II (90 lessons), Maths for Informaticians (90 lessons), Basics of the Internet (30 lessons), Basics of Programming (60 lessons), Text and Picture Processing (90 lessons), Basics of Digital Technique (15 lessons), Statistical Data Processing (5 lessons), Operating Systems (60 lessons), Information systems and databases (120 lessons), Object-oriented Modeling and Programming (90 lessons), Computer Networks (75 lessons), Education System Designing (30 lessons), Use of Information and Communication Technologies in Education (45 lessons), Operational Research (45 lessons), Informatics Teaching Methods (15 lessons), Exercises (60 lessons).

"During the four-year study future teachers get acquainted with operating systems and processes within the operating system, basic notions related to the information systems, their development, application, types, their creators and users, and basic operation on data. In the course Object-oriented Modeling and Programming, on an example of chosen language, students are trained for independent modeling, programming and use of object-oriented approach and methods on solving problems.

Through the Course “Computer Networks” students gain basic knowledge of structure and architecture of computer networks and communication services, and they are trained to use the Internet by their own. They are also trained to design education program supports and to evaluate them. The emphasis is put on the right choice of types of media, structure of the user’s interface and intelligence of such a progrem support. They also get acquainted with social, economic and cultural influences of computer communication systems, as well as with technological proportions, prospects and dynamics of their operational researches and mathematical theories most frequently used in the problems of operational researches. (Curriculum of Class Teaching Study with Intensive Elective Course of Informatics, 1999). Each course offers future teachers adequate theoretical and practical knowledge, and communication with lecturers is carried out in several ways, through:

- consultations as scheduled
- e-mail
- fixed and mobile phone as scheduled

During schooling two-way communication is encouraged, project work, field work and work in small groups.
During tuition, every future teacher (student) works at his own computer. In order to give top-quality lessons, the lecturer prepares lessons in digital form using a laptop and a projector. Contents of the course, literature and chapters of lessons can be found on the personal web page of each lecturer.

CONCLUSION:

The society of today has been defined as the society of knowledge, society which is ready to accept changes and to learn, society lies on several pillars, one of the most important being education. The mirror of every society reflects rays of knowledge towards other countries. The strength of these rays depends on the investment the country is making in education, and in return it obtains invaluable capital - knowledge. Investing in education of future teachers is investing in the future of each child. Out-of-date knowledge, obsolete technology, suspension of learning and researching, are the brakes of every education system, and negative consequences of such work are incalculable. As the teacher is always open to new challenges, the whole-life learning becomes the “style” of his life. Following and applying new technologies in his work, he offers to the student, environment and society top-quality education, which is connected with the quality of “life” of every country. Teaching and technological bases of education of teachers, as a segment of general informatization of society, are the guideline for the realization of high-quality schools in which informational education is understood as a new quality of higher education and transformation of higher education institutions (for the education of teachers) into modern, researching, path-breaking institutions in which students – future teachers will be active researchers and are creators of new forms of communication

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