Application of Computers in Methodical Planning of Natural and Social Studies

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Abstract

Learning preparedness of students is becoming one of the most important issues in modern education, and it could be established through development of new culture of methodology and teaching at all educational levels.

In this study, we started with the premise that quality teaching of the subject of natural and social studies in first four grades of elementary school, regarding some of the more demanding themes, is being conducted if both the teacher and his students are equally prepared for interaction through use of personal computers, directed by teacher's methodical ideas and prompted by students themselves during teaching and studying.

Computers in education, as modern informatics medium, demand from a teacher to master necessary knowledge and skills, putting him in a role of a mediator of knowledge. At the same time, that leads to a redefinition of the established educational goals and strategies, which remove the student from a passive position and put him into a center of the educational process.

The authors have methodically organized the educational theme "Introduction of students to understanding and orientation in time", presented by a spiral curriculum through application of personal computer and computer programs.

Introduction

Students in the contemporary schools are becoming more demanding. They are not satisfied with studies they consider boring. On the other hand, flood of information to which they are exposed beside the school leads to disorientation because it is more difficult to discern what is important for them. Therefore, educational process should enable students to become focused on problems. Teaching and studying should have meaning and purposeful effect. Teacher's methodical and teaching culture is of utmost importance in that task.

Competence in methodical approach helps teacher in choosing those teaching media which will simplify the learning process for students, so that they can form their own, personal attitude towards the content and the studying in some stages of educational process. In that context, application of informatics technology – personal computers – in learning of natural and social studies may be very effective. It should be noted that technical perfection of

computers is not of a decisive importance for their choice in function as a teaching medium for this teaching subject, but rather in the fact that their didactical-methodical purpose is in the way by which they form children's observation of the world (Meyer, 2002).

Science of informatics, as a complex of knowledge regarding processing, use and application of information, has a significant influence on a way of life in a modern society. The influence of new technologies on life, study, work and entertainment of both children and adults is constantly growing. However, one of the obstacles in development of skills in application of informatics technology is a lack of skill or resistance to its use by teachers (Commission Européene, 2000). In that context, research of methodical solutions through application of new technologies and their permeation in educational process represents one of possible methods of modernization of educational process "in stride".

One of the fundamental educational themes in the program of natural and social studies – Introduction of students to understanding and orientation in time - can be successfully implemented through use of computers. For a teacher to successfully manage this goal, he needs to know the details of content of this educational theme, fundamental tasks emerging from its objectives, and to be "computer-literate". Competence of teachers in application of informatics technology in educational process is no longer a matter of personal affinity or talent, but rather a necessity.

1. Theoretical observations of fundamental tasks of the educational theme "Introduction of students to understanding and orientation in time"

A child starting entering the first grade understands its environment as a unity of space and time. However, understanding of time – unlike the understanding of space – for a child of that chronological age is a much more complex mental process. Time, due to its abstractness, is not possible to demonstrate independently. Perception of time is possible only in present time, while past and future are undefined for a child at this age. Psychological research (Piaget, Inhelder, 1978) indicates that in children until six years of age, intuitive experience of time is predominant. Students in the first grade will successfully manage meaning of terms connected with defining of time (time of day: morning, noon, evening), and continue to enrich them with new terms, such as before noon, afternoon, early evening, based on personal experiences and activities they have during the day. These terms regarding the flow of time will then be further developed. The perceptive understanding of time leads to the operation of classification, when time is understood based on a sequence of events, in terms: yesterday, today, tomorrow, days of the week, and seasons. Students will be able to logically experience further understanding of time intervals, through a sequence of seasons of the year, connecting them with the

activities of people. In the second grade, students get to know time units, as when they are eight years old they will learn shorter time intervals in the program of natural and social studies. In that process they have to manage the instrument for measurement of time (a clock) and measuring units for expression of time (hour, minute, second, month of the year, year). In the third grade, students gradually build mental elements of the exact time definition on an imprecise definition of larger time periods: present, past and future, using time units of a decade, century and millennium. It is important that the students understand the decade as a main time unit, by which other precise time periods, such as century and millennium, are measured. In history, a century - as a time measure for orientation in time – is of a particular importance, and understanding of time and orientation in it are therefore completed through introduction of a real content. Students are introduced into understanding of historical time through known contents, and they orient themselves by regressive distribution of content. In the fourth grade, goals and tasks of the subject of natural and social studies are reaching their highest level in studying of social and historical past of our country, Croatia, through progressive distribution of educational content, from arrival of Croats to a new country until their independence. Tasks of the educational theme "Introduction of students to understanding and orientation in time" are thus achieved from concrete practical orientation of the first-grade students in a daily rhythm of life and obligations presented by the school in their time circle (Wolf, 1989), to training of students to understand and explain laws of social development, accepting fundamental principles of human rights to life in a community, and prompting a feeling of belonging to their homeland, Croatia.

1. **The role of a teacher in application of informatics technology in teaching of natural and social studies**

A new media environment in which children are growing up demands more initiative from educational system in order to enable application of informatics technology, particularly personal computers, and find its full pedagogical purpose in the educational process. This leads to enrichment of teaching communication, which can fundamentally change the position of participants in the educational process through the application of new technologies.

Application of computers in teaching of natural and social studies enables bi-directional communication, and at the same time stimulates independent studying accompanied with optimal ways of information gathering. Student is in the center of the educational process in which he establishes direct communication with the source of knowledge, which then takes over didactical functions of a teacher. During preparatory phase, teacher is an organizer who becomes a coordinator of the educational process. Through application of personal computer

in teaching, teacher can didactically combine individual, individualized and collective forms of studying. Therefore, introduction of informatics technology in education opens new possibilities for organization of work, which enable fulfillment of various needs of children. We can accept the statement of scientists that no other medium has caused such a change in the effectiveness of studying, modes of studying, and position of students and teachers in the process of learning as much as a computer (Rodek, 1982).

All these advantages that personal computers have, could not be possible to implement without the computer literacy of the teacher, who stimulates the application of computers in an appropriate way in order to train students for life in a society of information and knowledge. Teacher is directing the focus of his work towards preparation of educational contents through application of computers in natural and social studies, using various informatics technologies. At the same time, he endeavors to stimulate students in everyday use of computers, so that students develop the necessary level of working skills. In this manner, use of computers is becoming an everyday practice and tool they will not fear.

Researching multiple advantages of application of informatics technology in education, the following is particularly emphasized:

- development of students' creativity;
- stimulation of students' curiosity and readiness for research;
- enabling students to become active participants in educational process;
- enabling application of different teaching forms;
- influence on development of fine motorics, skills and speed in performing certain movements;
- development of concentration and attention abilities;
- development of readiness to risk wrong answer;
- stimulation of health and hygiene habits; and most importantly
- enabling students for understanding of the world (and events) in which they live.

2. Application of personal computer in methodical organization of educational theme: "introduction of students to understanding and orientation in time"

2.1. Some particularities of first-grade students in application of personal computers

New social environment and new people, particularly during the first semester, are causing uneasiness and uncertainty in the first-graders. The fact that a student in the first grade is involved in education in which the teacher is introducing personal computer, and that student is even working on it (which is, as a rule, "meant for adults"), stimulates his confidence and assurance in new circumstances. His attention and concentration in some activities is not

longer than ten minutes (and no more than twenty minutes). In situation of the laps of attention, student often disturbs the entire group. An experienced teacher will not caution the student for the lack of discipline because he will know that the attention span is a function of student's development, and he will in advance knowingly anticipate introduction of different "minor activities" through application of personal computer, through which he will accomplish dynamic teaching and extension of students' attention span (Martincic and Poljak, 2001). That is exactly the advantage of personal computer, which can present the educational content of natural and social studies in a real or stylized way, visual and/or acoustic manner. At the same time, teacher will consider a selection of simpler examples and contents that are in harmony with developmental abilities of students. Teacher will also have in mind that the students in the first grade still do not know to read and write, and will therefore in his application of computers in natural and social studies use picture, illustration, audio and video recording.

2.2. <u>Application of personal computer in educational theme: Introduction of students to understanding and orientation in time</u>

Students during the first four grades of education are particularly impressed by introduction of new educational contents through modern informatics media and appropriate presentation programs. Under informatics technologies that are recommended in educational theme "Introduction of students to understanding and orientation in time", we included computer and video projector, and application of a presentation program Microsoft PowerPoint (2002). In preparation of didactic material the following additional technology was also used:

- digital photo-camera;
- scanner;
- printer; and
- digital or analog video camera.

Additional programs used in this methodical approach were:

- program for picture processing (Photo Shop);
- program for picture capturing (Corel Capture);
- program for drawing processing (Corel Draw or a similar program); and
- program for processing of audio and video signal.

In the first grade of elementary school, students already have some understanding of time through their personal experience. Through real images in contact with the nature, experience that students bring from their homes, and a wider social environment they acquired while staying at school, the teacher creates favorable situation of education and studying, in which

studying is founded on contents the students are intimate with. A presentation of a line of photographs taken from the photo-albums of students, appropriately chosen texts from various magazines, books, animations, audio and video recordings is accomplished through the application of video projector. Effects used in text and photographs are applicable for combination of one or more slides, thus creating an atmosphere, as if the student himself is involved in the activities that are presented. In the course of this work, the starting points are graphics and terms of *hour, time of day, days of the week, month, and year*, demonstrated through animated characters and short texts, and experiencing time positioned in a well-known space in a simple and effective way. This manner of studying of given contents is interesting to students, because learning is happening through play with known contents from their childhood. In that case, they are not involved in this process only intellectually, but also emotionally, and sometimes even physically. This makes learning of abstract contents in this demanding program theme rather entertaining and close to the students. Students do not need to be stimulated to get involved in the education because the choice of personal content causes spontaneous involvement, which leads to excellent results. In this manner, the goal of this theoretical and practical work on acquisition of knowledge in this educational theme is accomplished.

In the third and fourth grade of elementary school, further gaining of knowledge regarding the exact determination of time, getting to know the shorter and longer historical periods of decade and century, and understanding in historical time, as well as skillful orientation in it, are managed through application of computers, using slides that represent time line. With the abundance of material scanned from children's photo albums, and applied to the time line which shows the flow of nine years, which is their age at the third grade, the students are ready to entirely adopt the term of a decade. Once the decade is accepted as a known term, which they visually and mentally adopted, the students will be able to orient themselves without problems in even larger time interval, a century. Well-chosen and well-prepared historical pictures, by the teacher's estimate, from the past of our country, Croatia, different entries from the narrower and wider native country of Istria, which are skillfully scanned and presented through slides on a personal computer, and different combination of audio effects, will refresh the educational process, and stimulate research style in teaching of natural and social studies.

In the course of educational process and in the form of presentation, the teacher has to anticipate also some slides that contain questions for testing the learned substance, or – if possible – presentations of some information by students, through their personal experience.

Educational material which is close to the students will help them to spontaneously get involved also in the phase of testing of the learned substance. The atmosphere of anticipation, curiosity and recognition leads students from the well-known towards the unknown, and the evaluation of knowledge will not be repulsive to the students.

It is correct to say that this demonstrated educational method through the application of computers and use of different computer programs requires more time for preparation of the educational content, as well as a good knowledge of the informatics technology by the teacher, confirmed by their correct selection. In the realization of teaching with the help of computers, it is necessary to ensure also a certain technical conditions: the appropriate school-room, if possible specialized, equipped with a sufficient number of computers, video projector, and computer programs.

Students' readiness for this type of work and its effects will be the most valuable prize to a teacher-enthusiast. Students are becoming so relaxed and open in the course of study through application of personal computer, that they exchange their observations and experiences without difficulties (Wood, 1995). They are learning to communicate, respect and accept other opinions. This satisfies the premises for quality and effective teaching and studying. At the parents' question "How was the school today?" the students no longer reply "Boring!", but "Great!"

One of the possible ways of methodical organization of this educational theme through application of computers and use of different computer programs ("Suncica in the nature" – multimedia program, 2000) is exhibited on the enclosed CD, and presented at the International symposium of the College of Pedagogy in Pula, "IV Days of Mate Demarin", Brijuni.

3. Conclusion

A quality education of natural and social studies in the first two grades of the elementary school are enabling students in successful orientation in everyday life, in their daily and weekly obligations presented by the school and the family. In the third and the fourth grade, the students are mastering the more abstract time categories, and gradually entering into understanding and defining of modern social phenomenons, as well as content from the national history of our homeland, Croatia.

These goals can be accomplished in a more appropriate way through introduction of personal computer and different informatics tools and programs in education, which helps the students of a younger school age to understand the world around them, and create a positive

relationship with the more difficult themes. It is important to stress out that introduction of the new technologies leads to a spontaneous evaluation of acquired knowledge.

Introduction of new technologies in educational training inevitably alters the role of students and teachers in the educational process. However, modernization of this process "in stride" requires "computer-literate" teacher, who manages his work in actual everyday situation. In the system of education of the future teachers, higher educational institutions should give this question an appropriate meaning.

Reference:

Commission Européene (2000). Seitze indicateurs de qualité – Raport européen sur la qualité de l`education scolaire. Luxsemburg: Office des publications officielles des Communautes européenes .

Meyer, H. (2002). Didaktika razredne kvake. «Educa» Zagreb.

Microsoft PowerPoint Version 2002 Step by step.(2002). Perspection, Inc, USA.

Multimedijski program (2000). «Sunčica u prirodi». 32. bita d.o.o., Zagreb.

Muradbegović, A., Žufić, J., Plejić, I. (2003). Primjena računala u nastavom predmetu Priroda i društvo od I .do IV. razreda, Multimedia presentation on CD, Pula.

Nastavni plan i program Prirode i društva. Prosvjetni vjesnik, special edition No. 2.,(1999). Glasilo Ministarstvo prosvjete i športa, Zagreb.

Piaget, J., Inhelder, B.(1978). Intelektualni razvoj djeteta. «Zavod za udžbenike i nastavna sredstva», Beograd.

Rodek, S.(1982). Didaktički aspekt kompjutorske stimulacije. Zagreb.

Šavle, S., Damašek–Padjen, S., Jerčinović, N. (2003). Metodički priručnik za nastavu informatike u 1. razredu osnovne škole. Adamić, Rijeka.

Wolf, A., (1989). Uvođenje učenika u shvaćanje vremena. Obrazovanje i rad, 1-2., 83.-92.

Wood, D.(1995). Kako djeca misle i uče. «Educa», Zagreb.