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Tom J. van Weert, editor

Information Technology project in Slovenian schools

Vladimir Batagelj
University of Ljubljana
Department of Mathematics
Ljubljana
Slovenia

Prof. Dr. Vladislav Rajkovic
University of Maribor
Faculty of Organisational Sciences
Kranj
Slovenia

J. Stefan Institute
Ljubljana

ABSTRACT

In 1994 the Slovenian government started the six year project *Information Technology in Slovenian Schools*. The aim of the project is to rise the level of computer supported informatisation mainly in elementary and secondary schools. It should contribute toward a problem oriented, more efficient and more friendly school. The project deals with providing appropriate hardware and software, teacher training and organisation. A special emphasis is on the research and development approach. There are some strategic subprojects concerning teaching methods, information technology and networks, use of knowledge base systems and multimedia.

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INTRODUCTION

Experiences

The informatisation of Slovenian schools started already in the early seventies with a computer literacy project in secondary schools. In 1972, 30 experimental schools were participating in the project, courses for teachers were taking place and a textbook for teachers was prepared [1], [2]. Two years later, in 1974, the first textbook for pupils was published [3]. After the evaluation in 1976 the computer subjects were regularly introduced in the secondary school curricula [4], [5], [6], [7], [8], [10]. In 1980 special computer oriented schools were established.

The appearance of the microcomputer also affected our schools. Spectrum and Commodore computers entered our elementary and secondary schools as a result of the HW and SW standardisation initiative in 1983. From 1977, each year a competition in computer science for secondary school students is held [9]. In 1988, the first *International Computer Science Olympiad* was held in Nova Gorica, Slovenia. Summer schools for gifted children are also regularly organised. In 1987, the Logo project started. We produced our own version of logo - LogoS [11], [12],[13]. TV-series about logo were produced in 1991.

The shift to PCs in the computerisation of schools in 1988 was the task of the Racek (Duck) Project. It resulted in some software projects for schools (for example computer aided Timetable), series of books (Racek library: MS-DOS, Turbo Pascal, dBASE, LaTeX, Derive, WordStar, Windows) and a specialised journal for new information technologies *Nit*. The emphasis was on penetration of computers into other subjects together with appropriate teacher training.

In 1992, Petra Project started the informatisation of the 5th class of elementary schools. In the selected subjects, i.e., Language, Arts and Technical Education, the role of information technology in achieving a new quality in teaching was experienced [14]. Other subjects (Biology, Geography, History,...) are under development. In 1994/95 175 elementary schools took part in the project.

The situation today

Speaking in terms of previous experiences, it has to be concluded that the computing power met real teaching needs only as late as at the beginning of the nineties with multimedia and networking capabilities. The user-friendly software encouraged teachers to prepare their own teaching materials. Today, answers to the following questions should be given:

- What should we know about teaching, learning and technology in order to provide appropriate educational possibilities for pupils who will be living and creating in the 21st century?
- What changes in traditional didactics are needed?

- How can teachers educated in the industrial age learn about technology which would enable them to create an interactive teaching environment and change their role?
- What kind of partnership is needed for development and implementation of new educational models?
- What kind of strategy is needed for a change towards a new information technology?
- What kind of knowledge and skills should be built in teacher's education programs?

Answers to these questions cannot be automatically obtained from other experiences. We have to take into account our particularities which are mainly reflected in limited resources of various kinds. Having a relatively small population, one of our educational goals is to see the importance of every child and to optimally develop her/his gifts and skills. Simple, not too complex solutions are appropriate. The individual potential of teachers and students should be activated by providing a new creative environment. Information technology should be presented as a challenge for better and more creative work.

In 1994, the Slovenian government started the new six years project **RO - Information Technology in Slovenian Schools**.

THE MISSION OF THE PROJECT

The aim of the project is to rise the level of computer supported informatisation mainly in elementary and secondary schools, thus contributing toward problem oriented, more efficient and more friendly schools. Information technology offers the possibility and opportunity to increase man's capabilities. The way we live and work together has changed. It enables us to do things we have not been doing before. The use of human knowledge is intensified.

The project aims to create possibilities for informatisation both on the teaching and the organisational level. Computers in schools should support teaching goals and curriculum integration. A stepwise approach based on creation of "potential differences" will be used. This should motivate teachers for the research and development approach. The project approach also contributes toward an efficient spending of funds. At the end of the project, the informatisation should become an integral part of the educational system.

HARDWARE AND SOFTWARE

In 1995, there were in Slovenia 450 elementary schools with 214.000 pupils and 3800 PCs (of which 3200 had Windows), and 150 secondary schools with

100.000 pupils and 3200 PCs (of which 2400 had Windows). As already mentioned, standardisation foresees minimal standards and tries to follow changes in information technology development. Presently (December 1995) minimal standards for the classroom equipment require at least a 486 PC, 8 Mb RAM, colour VGA monitor, and LAN support.

Different equipment is needed at different places in schools, such as a teacher's presentation set, computer equipment for the teachers room, laboratories, library and off-site activities (notebooks). A special emphasis is on network (Internet) connections.

School is constantly faced with the problem of ageing of its equipment. The life-time of information technology is even shorter. As a possible solution of the problem we propose an upgrading and renewal model. After two years school computers should be sold, either to teachers or pupils, for example, for 30% of the price.

Besides hardware, a selection of standard software tools and packages (OS, text formatter, drawing package, spreadsheet, data base, ...) was provided for all schools. In spring 1995, Microsoft donated its main products to our schools. These were distributed on CD-ROM - at this occasion we equipped all our schools with at least one CD-ROM drive. We are strongly supporting the use of the legal software in our schools.

A *Catalogue* of educational resources is planned to be established on the network to provide information (including evaluation results) about existing products (all types of programs, data sets and media materials, ...) and their distribution. In this way we would like to encourage local software development and exchange of the software and other materials produced by teachers and students. Modern authoring systems enable teachers to create their own educational multimedia materials. To support this, we have to provide them with a lot of free raw material (data, documents, pictures, sounds, videos,...).

There is a serious problem in the lack of teacher's skills to manage the available software and hardware. Apart from the teacher's pre-service and in-service training, we approach this problem with some organisational solutions (distribution of installed software on CD) and with gradually introducing IT technicians in schools.

TEACHER TRAINING

Teacher training is one of the main goals of the project. Only qualified and thus self-confident teachers can assure appropriate informatisation and efficient use of IT resources. Though future teachers will obtain adequate basic IT knowledge in their regular pre-service education, in-service training will also be needed [15].

As early as the mid-eighties we at the University started with a 150 hours basic in-service course in computer education for teachers. At present, courses for specialised topics in information technology are also given by other institutions (Catalogue: 50 different courses - 10000 participants). A vital segment is also teacher self-education which is supported with various materials (textbooks, manuals, guidelines,...) and services (consulting, mail lists, network conferences,...).

A promising organisational approach is cascade training in which research-based schools play an important role.

RESEARCH-BASED SCHOOLS

Research-based schools, elementary and secondary, are schools with adequate human and material resources performing the task of an information, education and advising centre for IT. In their selection, both regional spread and subject (mathematics, history, biology, ...) excellency are considered as criteria. Such schools have a priority in teacher's training and provision of the IT equipment.

The role of research-based schools is to offer prototype solutions for other schools in the neighbourhood and/or in the assigned subject field. The solutions are developed in the joint projects with universities and other institutions and firms. Their contributions toward informatisation of subject curricula are very important. Research-based schools explore the strengths and weaknesses of IT and serve as a lighthouse, with a special emphasis on didactics and methodology.

RESEARCH AND DEVELOPMENT

The whole IT project is essentially a research and development project. It consists of strategic, basic and implementation sub-projects. Strategic sub-projects cover main lines of the project (multimedia in education, IT and networks, expert systems in education, didactics and teaching methods). Basic sub-projects deal with informatisation of curricula for selected subjects. Implementation sub-projects operationalise results of the former types of sub-projects. A special attention is paid to nationally relevant topics: geography, history, language, arts, ethnology.

As already mentioned, the co-operation with Universities and Research Institutes is of vital importance. International collaboration also takes place. We are involved with the Colos project and in some Tempus projects.

There is a standard procedure applied for submission, surveillance and evaluation of sub-projects. Evaluation of proposals is based on a multi-criteria approach carried out by a committee of reviewers. Their report serves as a basis for the final decision by the project steering committee.

CONCLUSIONS

We believe that the success of the project crucially depends on the following factors: informatisation of curricula, networking and multimedia, teacher education, establishing the life-cycle of IT equipment and introduction of IT technicians. Essentially, all project activities will emerge from the informatisation of curriculum with the aim to enrich the process of teaching and learning. Networking and multimedia will provide a new framework for communication and open new frontiers of knowledge activities.

The research and development approach will disclose advantages and disadvantages of IT. Though we are fully aware that IT does not always offer all the answers to educational problems, its indisputable indispensable contribution to the quality of life in schools will be fully explored.

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