МАТЕМАТИКА И МАТЕМАТИЧЕСКО ОБРАЗОВАНИЕ, 2006
MATHEMATICS AND EDUCATION IN MATHEMATICS, 2006
Proceedings of the Thirty Fifth Spring Conference of
the Union of Bulgarian Mathematicians
Borovets, April 5–8, 2006

THE SURVEY "INDICATORS OF ICT APPLICATION IN SECONDARY EDUCATION"

Petya I. Assenova, Svetoslav I. Ivanov

This report presents the results of one statistical survey (2003–2005) on ICT in school education for the South-East Europe region, managed by the UNESCO Institute for Information Technologies in Education.

1. Background. UNESCO Institute for Information Technology in Education (IITE) launched a sub-regional project for South Eastern Europe *Information and Communication Technologies for the Development of Education and the Construction of a Knowledge Society.* Eight countries from the region were involved in the project: Albania, Bosnia and Herzegovona, Bulgaria, Croatia, Macedonia, Moldova, Romania, Serbia and Montenegro. The duration of the project was 3 years (2003– 2005). The survey "Indicators of ICT Application in Secondary Education" is a part of this project. The statistical data was collected according to the special questionnaire in November–December 2004. The results were summarized in 2005. This report describes the regional picture received and comparison with the Bulgarian context. It could be useful to draw measures promoting educational planning, policy-making and implementation of ICTs in school education.

Table 1. Presence or absence of the following in the implementation of the national policies on ICT application in education

Country	Master Plan	Timeframe	Separate Unit	Monitoring and Evaluation Scheme	Budget Plan
Albania	Yes	Yes	Yes	No	No
Bosnia and Herzegovina	Yes via projects	Yes			
Bulgaria	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Croatia	Yes	Yes	No	Yes	Yes
Macedonia	Yes via projects	Yes			
Moldova					
Romania	Yes via projects	Yes			
Serbia and Montenegro	Yes, but not separate policy	Yes	No		

2. Polices of the countries. Table 1 illustrates availability of some components of the national ICT policies in education.

Bulgaria was among the countries with well developed policy for Informatics/ICT in schools. In 1998 the Bulgarian education was the first branch having a policy towards the information society. This document had the essential role in negotiations for joining Bulgaria to the European Union (the chapter "Education"). Later, in 2003 the next government developed a new modernized strategy with Action plan and finding, taking into consideration the new needs of the society, new development of IT and new political conditions.

Table 2 presents the state of the national curriculum.

Table 2. ICT national curriculum

Country	Separate compulsory subject	Separate elective subject	Integrating ICT in other subjects	Others
Albania	X			
Bosnia	X			
Bulgaria	**X**	**X**	**X**	**X**
Croatia	X	X		
Macedonia	X	X		X
Moldova	X			
Romania	X		X	
Serbia	X	X		

As it is shown above, Bulgaria is the only country developed all forms of ICT education – separate and integrating, compulsory and optional.

According to the data collected Serbia and Montenegro involves ICT as a separate course in primary education. Croatia, Macedonia and Romania begin from lower secondary education. Bulgaria and Albania involve ICT education too late – in upper secondary schools (grade 9, age 14–15). The last development in our educational curriculum put ICT education in the curricula of every school year. This requires fast organization for qualitative training teachers and provision of appropriate equipment for all schools.

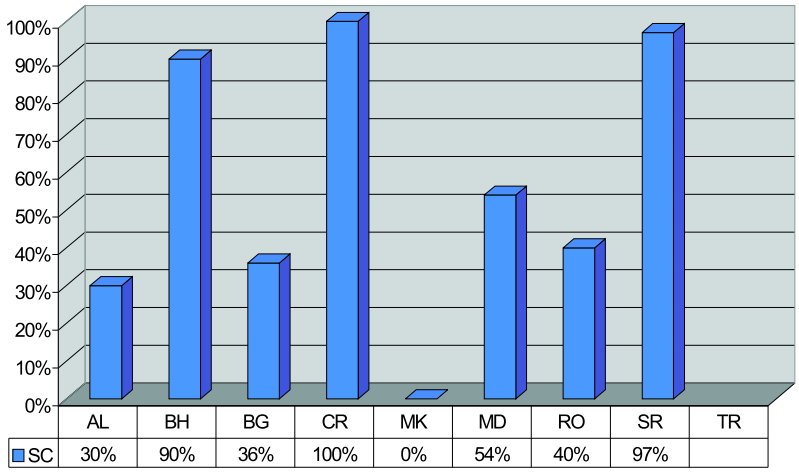
3. Computer equipment and Internet access

Diagram 1 presents data on the percentage of the secondary schools from participating countries, equipped with computer classrooms.

Five from the eight countries have better results than Bulgaria at that time. Albania and Macedonia are behind only. Bulgaria has to compensate the drop behind in short terms to provide the technical base for the new ICT curriculum.

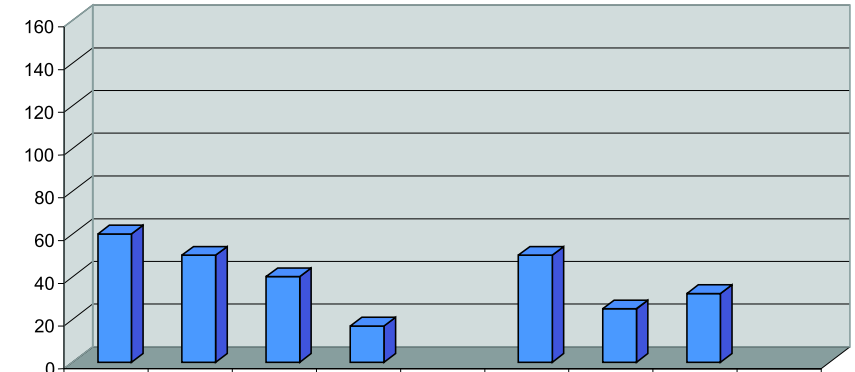
The EURYDICE report "Key Data on Information and Communication Technology in Schools in Europe" shows that in most European countries students aged 15 work 20 pupils per one computer (data for 2000 year). Denmark, Finland, Liechtenstein, Luxemburg, Norway, Sweden and UK have a ratio less than 10. The present survey results (for 2004) are presented in the Diagram 2. The best picture (17 students per computer) belongs to Croatia and it is close to the average European statistics. Romania follows with 25 students per computer. For Bulgaria the survey shows average 40 students per

Diagram 1: Schools equipped with computer classrooms



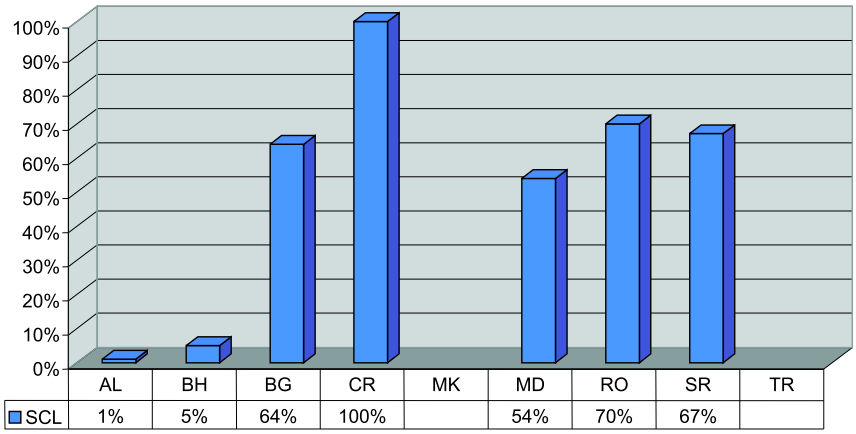
	AL	BH	BG	CR	MK	MD	RO	SR	TR
SC	30%	90%	36%	100%	0%	54%	40%	97%	

Diagram 2: Average number of students per computer in schools equipped with computers



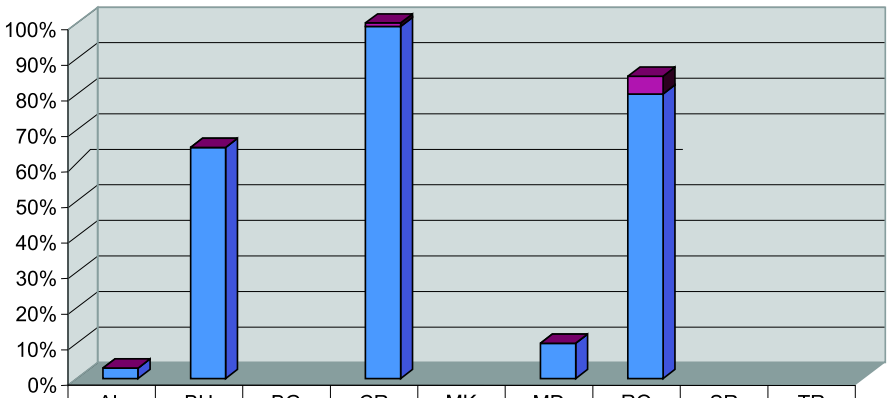
	AL	BH	BG	CR		MD	RO	SR	TR
NC	60	50	40	17		50	25	32	

Diagram 3: Schools equipped with a local network in the total number of schools equipped with computer classrooms



	AL	BH	BG	CR	MK	MD	RO	SR	TR
SCL	1%	5%	64%	100%		54%	70%	67%	

Diagram 4: Schools with Internet access via dial-up connection and via dedicated channel



	AL	BH	BG	CR	MK	MD	RO	SR	TR
ID	0%	0%		1%		0%	5%		
IC	3%	65%		99%		10%	80%		

one computer in schools equipped with computer classrooms. Three countries (Croatia, Romania and Serbia) have better result from Bulgaria and three countries – worse result.

Diagram 3 gives the picture about the availability of local networks in schools having computer classrooms. All schools in Croatia have LAN. Albania shows the lowest result – only 1 % of these schools have LAN. More than the half of the schools with computer labs in Bulgaria, Croatia, Macedonia, Moldova, Romania and Serbia use local networks.

Diagram 4 shows the Internet access. The best result is recorded in Croatia – 100 % of the schools with computer classes have access to Internet (1% *via* dedicated channel and 99 % *via* dial-up connection). Romania follows (5% *via* dedicated channel and 80 % *via* dial-up connection). The schools in Macedonia have not access to the global network. The Diagram shows that the most widespread connection is dial-up. The schools have not contemporary means for Internet connection. Bulgaria had not data available at that time.

5. Conclusions. Data mentioned above shows an actualization of the national policy on ICT in education for all countries – members of EU and countries from Sout-East European region. Recent Bulgarian governments have taken special measures to support promoting the school computerization. Special projects were lounged and 30 mln. lv. were planned in the budget for school equipment in 2005. The plan involved 700 new schools to be equipped and 39 000 teachers to be trained. Educational portal is planned to be lounged for the educational materials. Part of this activities have been already started. The Ministry of the Transport and Telecommunications is a close partner of the Ministry of Education and Science in the process of computerization. The joint program "E-Bulgaria" has a subproject "E-Class" directed to the modernization of the technical and technological base of the schools. In the frame of this project all Bulgarian schools have to equipped until the end of 2005.

The problems of the computerization don't finish until the equipment and short ICT courses for the teachers only. Teachers, especially newer for this field, need more permanent cares and help in their practice. The regional recourse centers could meet their needs and propose continue education, instructional guides, exchange of experience. The question for the service of the technical base is not decided completely yet. The government have to decide the problems with preferences for Internet and equipment for the schools. These are a part of the problems only, which needs the integration of the forces of different branches, experts and educators. This decision will give new chances to our young people in United Europe.

REFERENCES

[1] Nacionalna Strategia za vavejdane na informacionnite I komunikacionni tehnologii v bylgarskite uchilishta, Ministry of Education and Science, 2004

[2] Obrazovanaieto – investicia v badeshteto, Ministar Nikolai Vassilev, 24.12.2004, `http://www.mtc.government.bg/`

[3] Indicators of ICT Application in Secondary Education – Survey for Bulgaria

[4] Indicators of ICT Application in Secondary Education, IITE, Moscow, 2005

Petya Ivanova Assenova
Department of Computer Science
New Bulgarian University
21, Montevideo Str,
1618 Sofia, Bulgaria
e-mail: pasenova@nbu.bg

Svetoslav Ivanov Ivanov
Information Technologies Department
Ministry of Education and Science
2A, Dondukov Blvd
1000 Sofia, Bulgaria
e-mail: s.ivanov@minedu.government.bg

ИЗСЛЕДВАНЕТО "ИНДИКАТОРИ ЗА ПРИЛОЖЕНИЕ НА ИКТ В СРЕДНИТЕ УЧИЛИЩА"

Петя И. Асенова, Светослав И. Иванов

Този доклад представя резултатите от едно статистическо изследване (2003 – 2005) за ИКТ в училищата от страните в Югоизточна Европа, под ръководството на Института за информационни технологии в образованието на ЮНЕСКО.