The Integrated Educational System.

The Impact of Information Technology on

the Educational Process

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Abstract: SEI (computerized educational system) governmental program, initiated in 2001, is a national approach whose objective is to computerize the education system by giving schools the necessary equipment, by designing a large number of software for the interaction student-contents of subjects taught, by offering psycho-pedagogical training to teachers in order to ensure the placing of the student at the centre of the teaching-learning process and by setting the premises of a computerized network as support of a modern management (Ilia F., 2003, p. 34). As a generic term, the "impact" envisaged in this paper is noticed in the analysis of the beneficiaries' opinions – managers, teachers, and students – about the usefulness and need of using the information technology in the education process. Probably the most significant answer obtained in this respect is the general opinion of students concerning the legitimacy of using the new technology in order to avoid socio-professional cast out. Most students consider that those who do not have access to a computer will be in a disadvantaged position later (90,4%), while only 8,7% think this issue is not important. The impact plans of the new technology on the educational process and system are countless, and determining them is a difficult and complex process. Anyway, a few incidence points have been found during the evaluation and they concern aspects of institutional development of schools, some implications for the professional training of teachers, as well as perceptions of beneficiaries regarding the effects of TIC (Information and Communication Technology) on students' proficiency and the development of digital skills.

Keywords: Information and Communication Technology; integrated educational system; differentiated education; technical support; advanced eLearning.

JEL Classification: I20; D83

1. Introduction

SEI (computerized educational system) governmental program initiated in 2001, is a national approach whose objective is to computerize the education system by giving schools the necessary equipment, by designing a large number of software for the interaction student-contents of subjects taught, by offering psycho-pedagogical training to teachers in order to ensure the placing of the student at the centre of the teaching-learning process and by setting the premises of a computerized network as support of a modern management. (Ministry of Education and Research., 2006, p. 4).

SEI is not an alternative solution to the traditional way of teaching (centered on the teacher) but a complementary one where teachers are the ones making decisions concerning the educational process – strategy, method, resources- so that a large number of students can reach the objectives of the curriculum. (Jugureanu, 2004, p. 24).

AeL (Advanced eLearning – learning system that requires the use of a computer) is an integrated system of teaching/learning and content management which makes the teachers' activity easier.

2. The Access to New Technology

When we consider the teachers' and students' access to TIC, we can notice some situations that deserve to be taken into consideration in the context of the educational use of the new technology and the importance of data gathered from this research in order to measure the degree of TIC introduction into the system. Thus, the access to new technology can be regarded as a factor that fulfils some conditions such as the degree of availability of the specialized training program, the digital skills, the degree of teachers' and students' access to computers and Internet at school as well as at home, time allowed for students' and teachers' access to SEI labs – conditions we will further describe.

Schools which have been given computer networks during the last years would need an evaluation of the socio-economic conditions as chances to use the computer and the Internet offered to the beneficiaries of the educational systems. The educational environment, and in this context, the local existing conditions will be the object of the analysis regarding the use of TIC resources.

Beneficiaries of this program are not only students – who, by the skills acquired are those making the program efficient, but also teachers who increase their chances of improving and training permanently as well as the possibilities to update their teaching and evaluating methods.

3. Teachers' Access to Courses for Using TIC

When it comes to using a computer, a quarter of teachers declare that their level is very good (3, on a level form 0 to 3), and almost half of them think they can use the computer in at least a satisfactory way. Differences between urban and rural areas in this respect are insignificant; an important difference could be that between high school teachers (29% say they use the computer very well) and middle school teachers (21%).

The level of teachers participating in using TIC technology courses is equally distributed on school years and on living areas. A third of the teachers have not attended any course connected to new technology, which is surprising considering the precocious character of initiatives, projects and programs for introducing TIC in the Romanian educational system.

We can notice a significant difference between the number of teachers declaring they can't use a computer and the number of those who have not attended a training course in using TIC. That's why it would be a good thing to increase the tendency to acknowledge the skills acquired from non-formal learning processes in this field. Such an acknowledgement would be necessary since it would support a clear distinction between "using the new technology" and "using the new technology in education".

Table 1. Distribution of teachers according to their attending TIC using courses

	Total	**Rural**	**Urban**
Yes	62,2%	59,6%	63,9%
No	35,8%	38,3%	34,3%
NonR	2,0%	2,1%	1,8%
Total	100,0%	100,0%	100,0%

Source: Report of evaluating research – SEI 2008

Three quarters of the teachers who have attended at least a training course in using TIC (77,89%) declare that they have graduated the course recently, during the last 3 years.

Permanent training in this field has increased since 2001. It is also interesting to notice that during the last year, differences between urban and rural teachers have faded, an equal percentage of teachers attending TIC training courses in 2007.

The explanation for the rural teachers' growing access to TIC courses in 2005 and 2006 is given by a training component of the SEI Program – we can notice the figures that show this significant difference is originated by the number of teachers attending AeL courses: 30% in the rural area compared to 23% in the urban area (Table 2.8), when over half of the teachers who say they have attended training courses have actually attended AeL courses.

Table 2. Participation in TIC training courses; differentiation according to living areas

	The year of graduating the last TIC course	Total number of teachers	R	U
1.-5.	Before 2001	3,13%	2,85%	3,28%
6.	2001	2,78%	1,58%	3,47%
7.	2002	3,36%	1,27%	4,56%
8.	2003	3,94%	2,53%	4,74%
9.	2004	8,91%	3,80%	11,86%
10.	2005	20,95%	23,73%	19,34%
11.	2006	32,52%	39,56%	28,47%
12.	2007	24,42%	24,68%	24,27%

Source: Report of evaluating research – SEI 2008

Table 3. The last TIC training course; differentiation according to living areas

	TIC training course	Total	R	U
1.	Initiating/using the PC/ TIC courses	15,0%	12,1%	16,8%
2.	AeL (course)	26,3%	30,8%	23,4%
3.	ECDL/ICDL.	1,0%	0,7%	1,2%
4.	Course/programming languages (Forte, C++, Pascal, Oracle, database, php, MySQL etc.)	0,6%	0,3%	0,7%
5.	Network administration/Administrating and using SEI labs	0,4%	0,7%	0,3%
6.	Module 3 (during training)/Training course	1,6%	2,3%	1,2%
7.	Postgraduate course	2,6%	1,8%	3,1%
8.	Other	3,4%	2,1%	4,2%
	NonR	49,1%	49,3%	49,0%
	Total	100,0%	100,0%	100,0%

Source: Report of evaluating research – SEI 2008

Hence, AeL course represents the first step in using computers in the teaching process for an important part of the Romanian teachers.

The analysis of the answers given by teachers reveals less encouraging aspects which are unacceptable in such an advanced stage of the computerization of the educational system. We find few (or not even one) training programs that aim at the pedagogical aspect of using TIC in the teaching process – these courses of "teaching with the help of the computer". At the beginning of 2008 we could say we are still in an early stage of efficiently using the new teaching, learning, and evaluating technology.

Compared to CCD, whose offers have attracted more urban teachers (44,8% compared to 27% of rural teachers), the educational software companies have created a process of training especially meant for the rural areas (35,57% compared to 18,46% form urban areas) (Table 4). This aspect emphasizes the previous argument regarding the usefulness of SEI program for rural teachers.

Table 4. The institution organizing the last TIC training course – percentage of the total teachers who have attended training courses

	Institution that organizes courses	**Total**	**R**	**U**
1.	CCD	38,22%	27,07%	44,82%
2.	SIVECO	24,85%	35,67%	18,46%
3.	ECDL(Romania)/ICDL	0,95%	0,64%	1,13%
4.	A firm/company	3,79%	5,10%	3,01%
5.	An association/foundation (NGO)	0,59%	0,64%	0,56%
6.	A university	12,19%	11,15%	12,81%
7.	My school/a school	13,49%	12,10%	14,31%
8.	Another institution	5,92%	7,64%	4,90%

Source: Report of evaluating research – SEI 2008

The opinion of most teachers (58,3%) concerning the usefulness of the contents of existing training programs related to the needs of the classroom activity is that they are adequate for the beginning, but in order to carry out some efficient teaching activities using the new technology requires direct experience and practice. 7,4% of the teachers consider that initial and permanent training programs should be improved.

Table 5. Opinions regarding the usefulness of training programs for using computers in the classroom

Do you think the initial and/or permanent training programs you have participated in are adequate for the practical needs of using the computer for teaching/learning activities in the classroom? To what extent?	
They are adequate for the first stage, but I still need practice/exercise	58,3%
They are adequate and suitable for the requirements of the practice; I don't need any other courses in order to carry out efficient teaching activities using TIC	17,2%
They are not adequate; the courses I have attended are not enough to plan and support teaching activities using TIC	7,4%
I don't know/ I have no opinion.	11,4%
NonR	5,7%
Total	100,0%

Source: Report of evaluating research – SEI 2008

Introducing more simulations and practical exercises would be an aspect of teachers' training in using the new technology for education which could be improved (situation mentioned by 10,8% of the practitioners). Moreover, organizing some regular training activities from simple to complex (16,4%), differentiated on subjects or levels of difficulty (6,5%), with suitable teaching material (7,7%) is considered to be an approach which would be a more effective training process with great advantages in improving pedagogical practice with a TIC component.

Table 6. Proposals to plan the training process in order to make it more efficient

How do you think one should plan the training process in order to use efficiently the new technology in education?	
On training modules, from simple to complex/In more stages/Regularly /at regular intervals (once a year, once every two years)	16,4%
More practice/ They should be focused on practice (not on theoretical aspects)	10,8%
In computer labs (and Internet access)/ They should have course support/ They should have (useful) software	7,7%
Differentiated on subjects/ On groups of teaching levels (middle school teachers separated from high school teachers)	6,5%
They should be taught by skilled instructors (who can communicate with students)/ seriously.	2,8%
In small groups (less than 20-25 teachers)	2,3%
They should be free	1,1%
They should offer enough time for thorough learning. Longer courses	0,8%
They should be mandatory	0,7%
Other answers	9,0%
NonR	10,8%
Total	100%

Source: Report of evaluating research – SEI 2008

If we continue the analysis of the training courses, we can notice a significant difference between teachers who have attended a specialized training program and those who haven't. The teachers who have attended a specialized training program have said that using the new technology in their teaching activity has had a positive impact on their students – on good students (83,3% compared to 64,5%), as well as on weak students (65,3% compared to 48,2%).

Table 7. Teachers' opinions on TIC impact on school performance, differentiated on student categories

Target group	The teacher has attended a TIC course	Impact			I don't know	NonR
		positive	negative	none		
On good students	YES	83,3%	0,4%	3,4%	10,2%	2,6%
	NO	64,5%	1,2%	5,3%	21,5%	7,5%
On weak students	YES	65,3%	3,9%	14,4%	12,8%	3,6%
	NO	48,2%	5,2%	13,7%	23,3%	9,7%

Source: Report of evaluating research – SEI 2008

It is also important that the non-answer percentage and the percentage of those who don't have the ability to estimate this impact is a lot lower for teachers who have attended TIC using courses.

Therefore, "teachers" consider technical training to be essential for "access". Although the number of teachers who can use the computer has significantly grown over the last years (about 50%, with differences accounted for between high school and middle school), it is still worrying that there is a high number of teachers who can't use the computer. The same observation concerns the number of those who haven't attended the TIC training courses, although data show an increased curve of teachers' participation at such courses.

Students' TIC access is stimulated by the increased interest these beneficiaries have for it, most of them (95%) declaring they would like to participate in more lessons using TIC. Their statement is supported by the significant percentage of students who use the computer at home (83%) or/and in other locations outside schools (21,5%), with differences between urban and rural areas as main location.

The educational software for school subjects is obtained mainly form SEI Program (free) and it is completed by software unloaded from the Internet or bought with school funds. These are completed by software made by teachers and students,

stimulating action supported by contests organized at national level. In this process the urban teachers have an advantage over the rural ones because of the large number of computer owners (85,1% in urban area compared to 69,4% in rural area) and the difference is the same concerning the Internet connection.

Emphasizing the positive impact TIC has on school performance, over 50% of the teachers declare that TIC has a significant contribution in achieving a differentiated education, also mentioning that producing the right tools requires a great effort. At the same time, it needs to be said that a tenth of the students have difficulties in using educational software, mainly due to the low level of their training. We also take into account the opinion (expressed by a large numbers of students) according to which working/interacting with the software doesn't help the weak students, and it also creates difficulties for them.

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