

E-Learning and Educational Software. Educational Projects and Experience of Implementation in Romania

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Abstract

The responsibility for education is nowadays shared: collaborative demarches and adequate commitment from all stakeholders is very much increasing the effects of education as a whole, oriented towards preparing competitive human resources equipped with competences for the 21st Century: cooperation, communication, critical thinking, creativity, innovation. In Romania, the emergence of a knowledge-based economy and the need to assure conditions of social inclusion to all for the 21st Century have brought into light the necessity to enhance the continuous development of the human capital according to a lifelong learning perspective. In these regards, innovative education strategies aiming to integrate ICT are effective and viable when supported by several stakeholders: companies, European institutions, NGOs, schools, teachers, education managers, parents and students themselves. The present paper focuses on the use of ICT in Romanian education system, using research data from several reports released in the last year. Throughout the article, we will be paying consideration to two assumptions: firstly, introduction of ICT helps students to have access to knowledge and to develop competencies for the XXI Century: critical thinking, problem solving, creativity, use of ICT; secondly, the introduction of ICT helps teachers improve the way they educate, by employing various updated resources, by improving their methods, by exchanging resources and ideas within larger online communities of professionals.

Keyword: E-Learning, educational software, knowledge society, develop competencies.

1 Introduction and Motivation

The general trend of Romanian society towards intensive use of new technologies, generated by the need to keep up with the evolving European economy, is encouraged, supported and pushed ahead by governmental programmes and complemented by several European initiatives or by projects developed by private companies. “*Today’s pupils took part actively in transforming the IT labs in classrooms, redefining IT as a support for teaching and the computer as a support for training. We are determine to involve the pupils more and more in developing their own knowledge as well as in the process of creating educational resources meant for future generations*”, R. Jugureanu, Vision 2020

– How Pupils See the Future of Education [6]. In the United States and also in UNESCO strategies these are referred to as the 21st Century Skills. The European Union in the Lisbon framework outlines eight domains of Key Competences for Lifelong Learning. These 21st Century Skills are critically important to support the challenges of the modern work-place and the dynamic and rapidly changing knowledge society. Highly structured and disciplined schooling systems do not necessarily prepare students well for the dynamics and challenges of the 21st century workplace and society. More self-motivated, individualized, group and collaborative learning processes, supported by ICT will contribute significantly to the preparation of a more agile modern workforce.

2 IT-Based Education System in Romania (SEI Program)

One of the most effective governmental action is the SEI Programme (*Sistem Educational Informatizat* – IT-Based Education System), started in 2001, aiming to equip schools with computer labs, to train teachers in the use of ICT, and to provide educational software to support the teaching and learning. The IT Based Educational System (SEI) is a complex program initiated by the Ministry of Education, Research and Innovation, aiming to offer ICT support for the Romanian education system. The Program is implemented in partnership by the state administration (RMER) and the private sector. The main companies involved in SEI implementation are the Romanian company SIVECO Romania SA, HP and IBM. SEI is aiming to provide all schools in Romania with complete IT solutions for use in the teaching/learning process. Also, the SEI program promotes ICT in education through specific projects designed both for administrative and educational purposes. The SEI Program offers new tools for use in schools, thus increasing the quality of the education process. It offers a substitute for expensive or dangerous instruments and experiments by means of virtual counterparts. Within SEI Program, the local, regional and country administration is provided with managerial and administrative support. The main components of the solution are: Hardware (IT laboratories); Learning, Content Management Solution (the AEL software system); Educational software and electronic educational content; Teacher training; Internet connectivity. AeL is an integrated Learning and Content Management System developed by SIVECO aimed to support professors/tutors, students, content editors, administrative staff and other stakeholders in the learning process. AeL is qualified of management and delivery of various content types such as interactive multimedia, tutorials, exercises, simulations, educational games etc. Its powerful knowledge base, which acts as a content repository and management solution, adaptive, configurable and searchable, allows first-time users to easily:

- create content (built-in HTML editor, mathematical formulae editor, test editors and wizards, glossaries/dictionaries editor);
- import/export content from files, archives/folders of resources, standard packaging formats like SCORM and IMS;
- adapt or modify content;
- derive their own courses from common content components.

These are the stages in the SEI implementation:

- **SEI-1 (2001-2002)**: the pilot period – design and experimental use of the main components, adjustments at different levels based on the data that were obtained;
- **SEI-2 and SEI-3 (2003-2004)**: the transition period – the communication lines and technical support were established, the general methodology for implementation was developed and the favourable area was covered at high-school level; the methodology for construction, approval and distribution of multimedia educational contents;
- **SEI-4 (2005-2008)**: period of the construction and generalisation of ICT in the education system.

2.1 Effects of SEI program in Romania

The results of this process are presented in a synthetic form (December, 2006):

- equipment: 76,000 computers and servers; 4,780 laboratories, auxiliary equipment included;
- IT labs at the Ministry of Education and the 42 county school inspectorates and teacher centres;
- computers for administrative use;
- educational software in every laboratory for teaching, testing and assessment, school management, educational content management.

The multimedia educational content distributed in each school includes 1650 lessons for grades 5 – 8 (*gimnaziu*) and 9 – 12 (high-school), 8500 lesson moments for: biology, mathematics, computer science, languages, history, geography, chemistry, physics, technology etc.; encyclopaedias, dictionaries, glossaries. Some 25,000 high-school teachers and 40,000 *gimnaziu* teachers have been trained in the use of ICT. The results of the 4th stage speak for themselves: 3270 laboratories in schools; 42 laboratories for the teacher centres; updates for the laboratories established in 2001; 1255 multimedia lessons; multimedia English lessons for grades 1 - 8; 40,000 teachers included in the training programmes.

An in-depth investigation carried out in 2008 by a group of researchers from several institutions reveals the following aspects of the SEI Programme: (a) to what degree different types of schools are provided with computers and other equipment, (b) students' and teachers' access to the new technologies, (c) to what degree these technologies are used, (d) the impact the use of the new technologies had in the beneficiaries' view (managers, teachers, students), including different kinds of problems which require interventions/ solutions, as well as human/technological/ financial resources. Representative samples in each category of beneficiaries were returning their opinions relevant for the entire Romanian education system: 195 school managers, 1588 teachers and 3953 students. We can already say that the SEI Programme establishes in the Romanian schools working practices based on 1:1 student-computer interaction model. In time, "*lessons in the SEI laboratory*" will become regular lessons – as frequent as the other lessons – where each student has access to an individual computer (Fig. 1).

With regard to the type of learning activities carried out with students, it's relevant to mention the average scores [*Based on the average which resulting from the transformation into a 0-1-2 scale of the ranking of activities based on their frequency*

(*never-rarely-often*)] which are higher for diversified activities in urban schools, especially with regard to those activities that encourage creativity and for activities which use the Internet (Table 1).

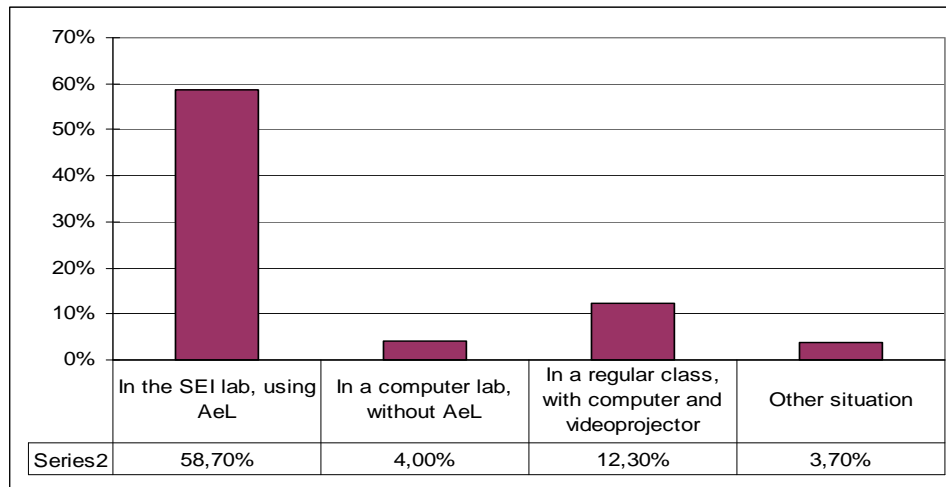


Figure 1. Situations in which ICT is used for teaching-learning-evaluation

	Total	R	U
Sequences when teaching and learning involve the use of electronic lessons (for my subject)	1.036	1.000	1.092
Tasks when the students work individually using ICT	0.965	0.912	1.051
Tasks when the students work in groups using ICT	0.958	0.929	1.003
Sequences when the students learn to use computer programmes (editing, computing, Internet browsing)	0.851	0.875	0.836
Sequences when the students use the Internet look for information	0.848	0.559	1.026
Activities when the students are required to be creative, to explore and to innovate, using especially ICT resources and/or the Internet	0.816	0.682	1.028
Activities having as a result a multimedia product (a film, a web page, a presentation)	0.655	0.539	0.833

Table 1. Types of teaching&learning activities involving the use of ICT; rural-urban differentiation

On average, a little past half (53.1%) of the students who participate in lessons taking place in the computer laboratory have access to an individual computer, 34.9% share a computer with a classmate at the same time, 7.1% share a computer with other two classmates and 1.3% work together with other three colleagues on the same computer, and 1.7% of the students work in groups even larger on the same computer.

Differences between educational levels are considerable in point of the number of students using a computer at the same time during classes in the computer laboratory as follows: most of the students who work alone on a computer are high-school (HSC) students (67.8%), and only 25% are *gymnazium* students (Table 2).

In this situation, it is obvious that the most significant inconveniences encountered by students during classes in the SEI laboratory are the limited time for computer use during classes, indicated by 35% of the students, and the number of students per computer, mentioned by 21% of the students.

		Total	GIM	HSC
1.	One student	53.1%	25.5%	67.8%
2.	Two students	34.9%	54.5%	24.7%
3.	Three students	7.1%	12.9%	3.8%
4.	Four students	1.3%	2.0%	0.9%
5.	Other:	1.7%	3.2%	1.1%
	No answer	2.0%	1.9%	1.8%
	Total	100.0%	100.0%	100.0%

Table 2. Number of students per computer

Extending the range of possibilities for using the computers available in the school to a series of current activities carried out by teachers (Table 3), we find out that the equipment and the Internet connection are mainly used by teachers for:

- consulting the school legislation or the news on the Internet: 54.4%
- creating worksheets for students, informative materials, sketches, assessments: 50.1%
- searching information to help them prepare the lessons – 46.4%.

At the opposite end, teachers use the new technologies least for creating educational soft (56.9% saying they don't use at all a computer for this activity), for communicating with students after school hours (49.2%) or with their parents (64.7%).

Activities carried out with the use of computers	Average
consulting school legislation or news on MoE website, official portals etc.	1.403
creating worksheets for students, informative materials, sketches, assessments etc.	1.384
information to prepare the lesson	1.375
teaching-learning activities in the computer laboratories	1.067
administrative activities: student records, filling-in pedagogical and psychological forms etc.	1.015
use of educational resources (enciclopedias, picture libraries, dictionaries etc.), delivered and installed by MoE/ school inspectorate/ Siveco Company	0.967
communication with teachers from other schools, via email, chat or the Internet	0.920
computer-based assessment tests for students	0.892
designing development projects for my school	0.755
contact with my students, outside school hours	0.549
creating educational soft	0.342
contact with my students' parents via email or the Internet	0.291

Table 3. Types of teaching-learning activities involving the use of ICT

Regarding the continuous professional development, teachers begin to see the value of the Internet and computers for information and documentation activities, for distance courses, for exchanges of experience, for learning computer programmes, for publication of articles etc. The use of the new technologies for professional development looks pretty much the same in rural and urban areas, teachers being equally aware of the opportunities of the computerisation process.

However, we can see that the use of ICT is still at the beginning and still far away from the quality and competitiveness promoted by the Ministry of Education and the strategy documents and recommendations of the European Commission: in early 2008, one in five Romanian teachers had never used the new technologies for information and documentation purposes, and one in four teachers said they had used only once in a semester a computer or the Internet for such activities.

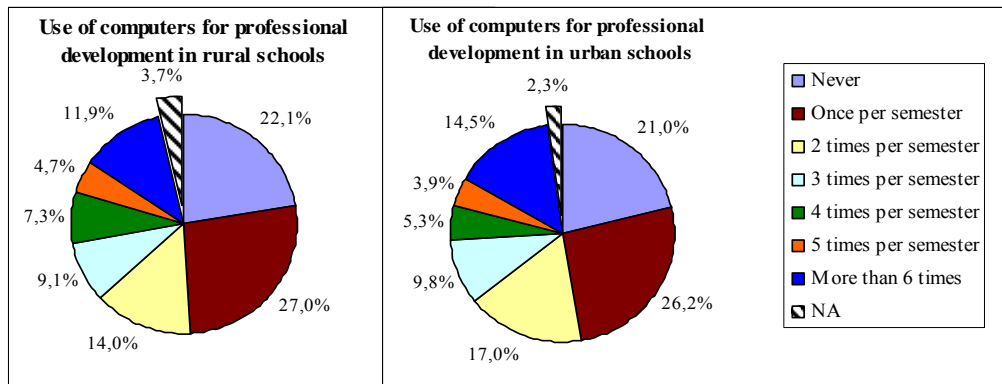


Figure 2. Use of computers for teachers' professional development; rural-urban differentiation

2.2 Effects of ICT Use in Education

Speaking about the effects of ICT use for learning-teaching-assessment, the teachers ranked some potential benefits, from several points of view (Table 4):

With regard to teachers, ICT contributes first to the facilitation of learning objectives, and then to the facilitation of teacher's activity; the modernisation of the educational process is not seen by teachers as an important argument for using ICT in designing, teaching and assessment activities;

With regard to students, teachers consider that classes in the computer laboratory are useful first because they facilitate students' understanding. Then, they mentioned the development of computer use skills, and last they pointed to the role of the new technologies in attracting and motivating students for higher achievement;

With regard to the organisation of the education process, the benefits of ICT are seen by teachers especially in connection with active, participative learning, as well as with cooperative learning; the contribution of ICT to individual or personalised learning is

surprisingly ranked last, although the majority of educational applications are more suitable for individual learning.

Segment	Poz	Estimated effects	Average place
Teacher	1	facilitates the learning objectives	1.856
	2	facilitates teacher's activity (design-teaching-assessment)	1.717
	3	encourages innovation/ modernisation of the teaching process	1.585
Student	1	facilitates understanding of different phenomena	1.973
	2	develops computer use skills	1.593
	3	improves the learning outcomes/ attracts students, develops interest in studying	1.534
Didactic activity	1	favours active, interactive, participative learning	1.787
	2	allows cooperative learning, develops team work abilities	1.785
	3	allows individualised/ personalised learning	1.501

Table 4. Positive effects of using SEI laboratories in teachers' view

2.3 Impact of ICT Courses on Teaching Practice

The attendance of ICT courses by teachers is equitably distributed among areas of residence and education levels. But one third of the Romanian teachers did not attend any course on the new technologies, which is surprising when considering the early initiatives, projects, and programmes for the introduction of ICT in the Romanian education system.

With regard to the usefulness of the existing training programmes (Table 5), when compared to the concrete needs for classroom activities, most teachers (58.3%) think they are appropriate for start, but the development of efficient learning activities based on the new technologies requires direct experience and a lot of practice. 7.4% of the teachers consider that the initial and in-service training programmes should be improved.

<i>To what extent do you think that the initial and/or in-service training programmes in which you participated are appropriate when considering the practical use of computers for classroom activities?</i>	
They are appropriate in a first stage, but I still need more practice	58.3%
They are appropriate and meet the requirements of real use; I don't need more other courses so as I can carry out efficient learning activities with the help of ICT	17.2%
They are inappropriate; the courses I attended are not enough for me to design and carry out learning activities with the help of ICT	7.4%
I don't know/ I have no opinion.	11.4%
No answer	5.7%
Total	100.0%

Table 5. Opinions on the usefulness of training programmes for the use of computers in the classroom

The introduction of more simulations and practical exercises is one way in which the teacher training programmes (Table 6) for the use of ICT could be improved (indicated by 10.8% of them). In addition, the organization of cyclic training activities, in phases from simple to complex (16.4%), differentiated based on subjects or level of difficulty (6.5%), supported by adequate teaching materials (7.7%) is considered by teachers an initiative which would support more efficient training, with real benefits for the improvement of pedagogical practices in the use of ICT.

Continuing to analyse the usefulness of training courses, one significant difference can be seen between teachers who attended a specialised training programme and teachers who didn't attend such a programme, more teachers from the first category saying that their use of new technologies in the classroom had a positive impact on their students – both on highly-achieving students (83.3% compared to 64.5%) and on low achievers (65.3% compared to 48.2%).

Target group	Has the teacher attended an ICT course?	Impact:			Don't know	No answer
		positive	negative	none		
On highly-achieving students	YES	83.3%	0.4%	3.4%	10.2%	2.6%
	NO	64.5%	1.2%	5.3%	21.5%	7.5%
On low-achieving students	YES	65.3%	3.9%	14.4%	12.8%	3.6%
	NO	48.2%	5.2%	13.7%	23.3%	9.7%

Table 6. Teachers' opinions on the impact ICT has on school achievement, differentiated across student categories

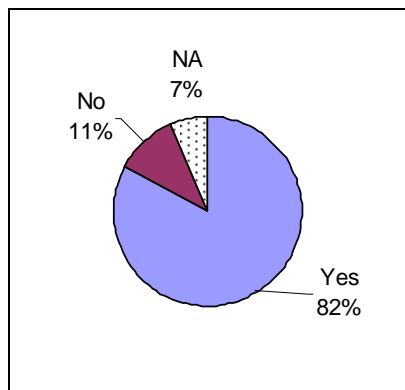


Figure 3. ICT courses improve the way teachers use technologies in the classroom

There is also relevant that the no-answer rate and the percentage of those who cannot estimate such an impact are lower among teachers who attended ICT courses.

A different study, measuring the impact of a very recently initiated teacher training programme, reveals the extent to which innovation penetrate the education practice. Intel Teach course (Essentials, ver. 10, face-to-face) started to be delivered in early 2008 in Romania and is aiming to train more than 15,000 teachers in a couple of years. More than 3,000 beneficiaries already graduating the programme were asked about the changes in the teaching and learning as a result of the course.

Being asked if they **have used technology in new ways** with their students (Fig. 3) since they

participated in the Intel Teach training, 82% of the teachers said that they did innovate their didactic activities.

Furthermore, participant teachers (Fig. 4) used the ICT firstly with the goal **to allow students create multimedia products** (22%), then to encourage cooperative skills and attitudes (13.7%) and to improve students' computer skills (12.2%).

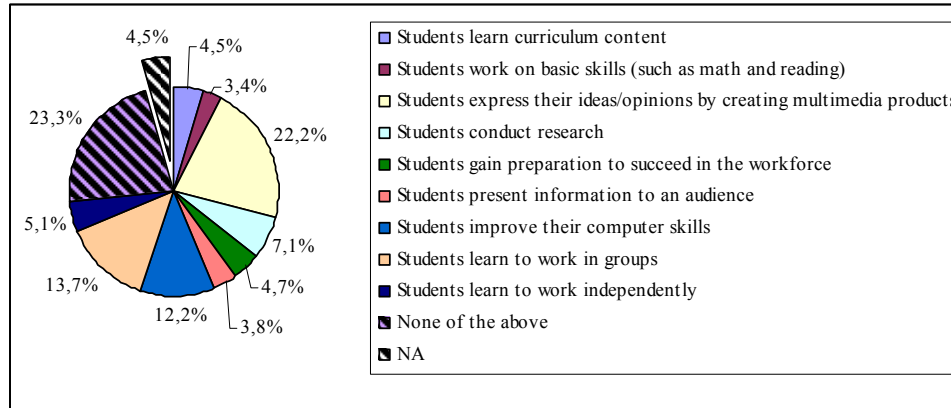


Figure 4. Goal of the computer-assisted lessons held after undertaking ICT course

The roles of the teacher are extending and continuously re-defined, ICT being one of the influencing factors (Fig. 5):

- ICT contributes to teachers' professional development through the addition of new competencies, useful for the activity with students.
- ICT stimulates the communication and collaborative activities within the teachers' community.
- ICT helps teachers in accomplishing administrative tasks they have at school.

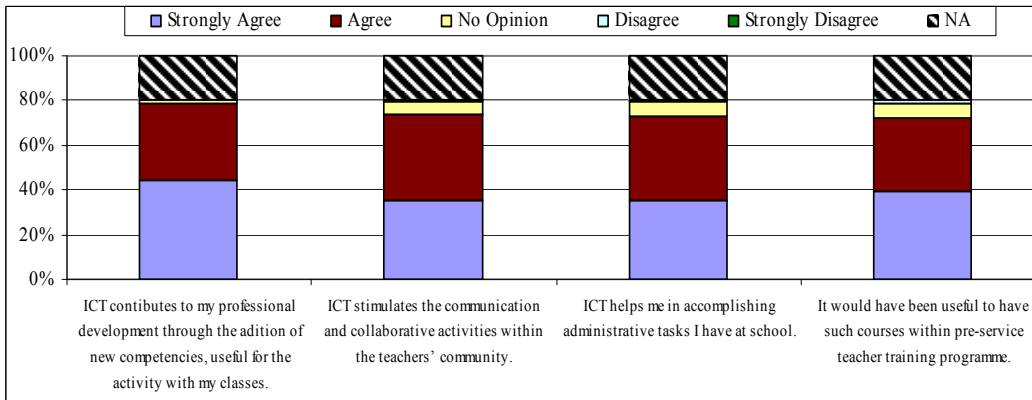


Figure 5. Teachers' view upon contribution of ICT to their professional development

More than 2/3 of the teachers agree with these statements. However, it is obvious that technologies is more and more becoming useful and effective instruments for educating

young generations, and it is a gain that most of the teachers are becoming aware of this fact.

2.4 Excellence Awards for SEI project

The European IT Excellence 2008 awards promoted by the prestigious publication – IT Europa, rewards annually the most efficient software solutions designed for commercial and governmental organizations. The quality of the implementation as well as the impact of the SEI project (The IT-based Educational System) were the main reasons for which SIVECO Romania managed to be successful in the European IT Excellence Awards 2008 Gala, receiving a new and prestigious European recognition. *“The eLearning solution provided by SIVECO Romania for the country’s Ministry of Education Research and Youth is an excellent example of how to deploy a multimedia based content management system tailored for a dynamic educational environment”* [John Chapman, awards organizer and Editorial Director of IT Europa]. SIVECO Romania and SANAKO launched the Virtual Lab for science experiments. BETT 2009, the largest educational technology exhibition, took place between the 14th and the 17th of January in London. 650 companies presented innovative solutions for the 21st century education, and the organizers estimated that more than 30,000 visitors from all around the world visited Olympia Hall (Fig. 2). As every year, at BETT are hosted revolutionary education products launches. The new products encourage the use of modern technologies for developing the education systems to better face the 21st century challenges (Fig. 6). SIVECO Romania and SANAKO Corporation launched SANAKO Study Science Lab.



Figure 6. The Virtual Lab for science experiments – BETT 2009, London – Olympia Hall

3 Experiences of Universities

Regarding the higher education system, the level of implementation of the new learning technologies as well as of up-to-date ICT infrastructure is quite high, mainly due to the involvement of Romanian higher education institutions within European and international projects in the field of technology enhanced learning, institutional development and other related fields. Beside the know-how transfer, the higher education institutions benefit of

higher funding resources through these programmes that increased substantially the funds received from the Romanian Government through different national programmes. Consequently, most of the higher education institutions have set-up a Distance Education department and some of them Technology Enhanced Education units that deal with the implementation of the new teaching methodologies within the traditional education activities.

CREDIS (Centre for Resources, Documentation, Information and Services for Open Distance Learning)

The Open Distance Learning Department of the University of Bucharest was established in 1994. It offers various distance courses, either initial, continuous or post higher education. By the Governmental Decision 944 /29 Aug. 2002 the University of Bucharest has 15 authorized specializations to function by distance education. The distance education programs have comparing to the regular study program the same curriculum, the same specialization, equivalent diplomas, all the rights of the graduates assured by law. The distance study program offered by CREDIS provides specific resources, individual learning tutoring, bi-directional communication and self-assessment facilities. The new ICT used are: CD-ROM, e-books, audio-video tapes, websites, and virtual laboratory. There is used ongoing evaluation as well as an final examination. The elearning platform used can be found at <http://portal.credis.ro>

SNSPA (National School for Political and Administrative Studies)

As an example the Department of Political Sciences from SNSPA have also on distance education program for post high education level. The admission procedure takes into account the bachelor diploma marks as well as the results of an short interview according to a fix number of places. It also provides tutorial facilities (speciality guiding and coordination of the student), run by university teachers and researchers. The curriculum is the same as for the regular study program and ends with exams accounting a certain number of credits.

The program is flexible with regard to the dates of the exams, recognition of the diplomas and opportunity to enter in the regular study program.

Any student may take the diploma exam provided he accomplished the required credits from the analytical curriculum aside the students from the regular study program.

Romanian-European eUniversity

Politechnica University of Bucharest has different projects in the field of elearning. One of the biggest impacts is the Socrates /Minerva project “Romanian-European eUniversity” accessible at the www.reu.pub.ro/re2u. Its aim is to become a major provider of services to universities as well as to lifelong learning communities based on the development of state-of-the-art innovative teaching and learning methodologies and emerging ICTs.

The main challenges for the Romanian-European eUniversity in becoming alive are:

- to promote a critical and responsible use of ICT aimed at supporting the innovation processes within the higher education system;
- to help the Romanian Higher education system to integrate itself in the European Higher Education Area;

- opens the universities towards the outside world by promoting the collaboration between the university and other actors in the economy and society;
- addresses the issues of access to higher education and lifelong learning by disadvantaged target groups.
- improved quality;
- addresses the issues of organizational and economic sustainability.

ASE - Academy for Economic Studies

ASE is one of the first universities from Romania establishing a distance education department. Yet it was mainly about the correspondence education than using modern information and communication technologies.

Babes Bolyai University

Babes Bolyai University is also offering some academic course for graduates and graduate education online.

Academia Online

Academia Online is a private initiative in the continuous education area, providing online courses either for free or chargeable. Since 2003, Academia Online stands for the Romanian model of quality elearning services, being the winner of Education Projects section of 2004 IT&C Awards of the Government of Romania. The award, along with the 35.000 students enrolled in online continuous courses, were for several years the Romanian barometer of interest in elearning, in the area of continuous/ adult learning. The success of Academia Online project is considered to be the result of the close co-operation between programmers, designers and researchers in pedagogy, as the public-private partnership (a private company and the Institute for Education Sciences) was exercised since the design stage.

4 Complementing and Supporting National Programs

Romania is part of global and European education initiatives which brings closer innovation, creativity, competence and commitment, in an effort to raise the quality and the equity of the education system and to complement the governmental steps towards developing an authentic knowledge society.

In particular, two programs have a visible impact on the education practice, contributing to the improvement of the classroom teaching, learning and assessment on the new co-ordinates set up by the 21st Century: development of new competences for future professionals, introduction of computer-assisted education, and increased importance of non-formal learning [7,8].

One of them is the **eTwinning project** [1], an European initiative aimed to link schools in order to develop collaborative projects involving students, and the other one is **Intel Teach program** [2], aiming to prepare teachers to better use pedagogy and ICT to create adequate learning situations. The two demarches complete each-other and overlap to a certain extent, one creating the premises for hands-on activities with pupils using the ICT and especially the Internet for collaborative activities, being based on the project-

based learning method, and the other setting-up the theoretical frame and the pedagogical tools needed by teachers to educate in the 21st Century. The first one is a community of schools and teachers, the second one prepare teachers to use new ICT tools to co-operate and to develop collaborative projects with their students. Furthermore, both initiatives are putting stress on the learner-centred approach and on the transversal competences as a result of learning: communication and social skills, using new technologies, critical thinking, collaboration, creativity.

eTwinning

eTwinning has an innovation and creativity dimension, addressing an area of the formal and non-formal education at the very heart of the on-going reform, allowing experimentation of new ways of teaching and new ways of performing traditional tasks. Being part of Life-long Learning Programme, accompanying Comenius action, the main aim of the eTwinning program is to facilitate communication and cooperation between schools in EU countries, involving students in new learning activities: creation of various collaborative educational projects with the use of ICT. So far, around 4000 Romanian teachers, from both urban and rural areas, initiated and participated in eTwinning projects together with colleagues from around Europe [1].

The eTwinning projects promote the use of ICT for development, allowing schools to incorporate innovative practices with impact at students and teachers levels, but also at institutional level. Participation to eTwinning allows pupils to learn using the new technologies, to communicate with their peers from other countries, to acknowledge other cultures' elements, and to improve their competences of communication in foreign languages. As indicated by their teachers, the students' enjoyment and motivation to accomplish learning tasks is significantly improving when they are involved in such collaborative projects. The teaching methods are also diversifying, becoming more efficient and motivating for learners, as a result of experience exchanges between teachers within eTwinning partnerships and professional development activities. Not least, the online twinning of schools allows the transfer of information and good practices at institutional level, having also, in some cases, an impact at community level. As stressed by the Romanian Minister of Education (March 2008), eTwinning initiative is a way to capitalise upon the investment in ICT equipments for schools – the Romanian IT-based Education System program – providing teachers proper pedagogical instruments to develop significant learning situations for their students.

Intel Teach

The support offered by Intel programs in Romania complements the demarches of implementing ICT in education, creating the premises for adequate education reform. The areas of support shows the concern and the added value provided by Intel to Romanian education system in the last years: development of education policies towards implementing education solutions for XXI century, teacher training programmes, access of teachers and students to reliable IT equipments, access to Internet and knowledge, support for education process through offering pedagogical materials for teachers, supporting Science education through participation to the International Science and Engineering Fair (the world's largest pre-college science competition, with more than 4

million USD in awards), establishing a common arena for eLearning stakeholders: education policy makers, researchers, teachers, education software developers, opinion leaders [2].

Intel Teach programme was accredited by the Ministry of Education, Research and Innovation in 2007. Implemented by SIVCO Romania and with the support of the County Teachers' Houses, the Teach Essentials course is run all over the country and the Romanian teachers are part of a global initiative which trained over 6 million teachers around the world. This coverage and impact have led Intel Teach to be called the most successful professional development program of its kind [12].

Within this initiative, along with the continuous teacher training activities, Intel was supporting the localisation of two significant packages of support-materials for teachers: Designing Effective Projects and Assessing Projects. Romanian teachers have access to pedagogical instruments, education projects templates and examples, in an extended range of curricular domains and levels.

5 Conclusion

In Romania, the emergence of a knowledge-based economy and the need to assure conditions of social inclusion to all for the 21st Century have brought into light the necessity to enhance the continuous development of the human capital according to a lifelong learning perspective. In these regards, innovative education strategies aiming to integrate ICT are effective and viable when supported by several stakeholders: companies, European institutions, NGOs, schools, teachers, education managers, parents and students themselves.

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