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VIRTUAL EDUCATION – MEAN TO PROVIDE THE KNOWLEDGES

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Abstract: *Nowadays, the educational system is submitted to some obvious quantitative and qualitative restrictions. Quantitatively speaking, the increase of teachers' number proportionally with the growth of educational request becomes ineffective and this is a phenomenon characteristic for all worlds' countries. It involves the need to find new means to diminish the specialists' pedagogical effort.*
Simultaneously with the quantitative growth, the educational request also bears deep qualitative mutations. Fewer people want to attend standard and rigid courses which don't fully correspond to their real needs and their traced line in life. To the "massive growth" of educational offer is opposed a mainly new solution – the "navigation" that allows a massive, diversified and also personified access to the existent knowledge and competencies.
These both major restrictions are abolished by the e-learning (education from distance). Actually, the distinction between "stationary" and "distanced" becomes lest pertinent owed to the use of telecommunication networks and interactive media support increasingly integrating into the traditional forms of education and learning.
From "lifesaver" for the traditional education, the e-learning as result of appeared restrictions is transforming in norm or at least in distinctive form to organize the educational system.
Virtual education features brings new dimensions to provide the knowledge in education field, offering new alternatives at traditional methods.

Keywords: v*irtual education, knowledge, e-learning, educational system.*

Virtual education, "a complex system of educational services for national and abroad public by the informational environment of training based on distanced exchange of learning resources"[19] or „synthetic and integer form of education based on the use of a wide specter of new and traditional informatics technologies and also on technical assistance means used to transmit the didactic material, its learning and permanent contact between teacher and student, differently situated in time and place"[20], allows us to fulfill a well defined goal, to grant to the requester of knowledge at their permanently or temporary residencies the possibility to get to the professional training programs dwelt by the superior education institution.

The main principles the virtual education is based on can be listed as follows:

- free choice of education place;
- free planning of educational steps;
- free choice of time and rhythm of learning;
- free will in choosing the teacher.

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[19] COLIN C., DURAND E., *Le guide des formations a distance*, Paris : L'Etudiant, 2002, p. 49-50
[20] ROCEANU I. *E-Learning - între teorie si practică*.; In: Buletinul Universității Naționale de Apărare nr. 4/2004, Bucureşti, Editura Universitatea Națională de Apărare, 2004. p. 35

The enumerated principles show a high level of democratization of the educational process adequate to the market economy and the democratic society.

In the virtual system of education the university and post-university programs provide the following *types and levels of professional training:*

1. University qualifications finalized with diplomas of university studies;
2. Post-university specializations inclusively by thorough studies and master programs, finalized with diplomas of post-university studies;
3. Post-university training finalized with graduation certificates;
4. Professional conversion of superior level finalized by diplomas or certificates.

Any form of education has its own informational level of instruction being conceived as the whole range of technologies of training and of methodical, technical and organizational provision oriented to the educational request gratification.

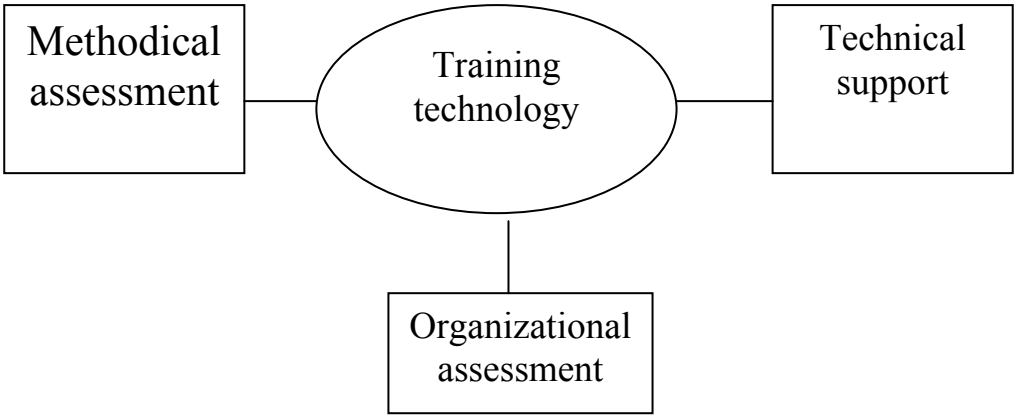

Figure 1. Components of informational environment for training

The components of the informational environment of training being specified, it remains to characterize them by virtual education regard, firstly, emphasizing **the training technologies.**

Nowadays, oftener there are affirmations that the educational system passes through the big technological revolution of the last centuries owed to the implementation into the studies process of the new informatics technologies.

Between them *IT-technology (or network technology)* becomes, today, the most spread technology of training based on the wide use of Internet and Intranet possibilities and also of guaranteed contact between teachers and students. This technology applying generated a special form of education – "virtual education", or "on-line education" or "e-learning".

What does represent **the virtual education?**

Some specialists see it as form of education at distance through which the educational services are offered to the wide public by new info-communicational technologies.

Corresponding to this approach, the goal of virtual education could be "to make accessible to anyone, anywhere and anytime the disciplines of any educational institution"[21]. Also, owed to the wide possibilities of communication the virtual education offers, it starts to be implemented also in the stationary education by so-called "method of distributed education"[22]. It integrates traditional forms of teachers' and students' communication in the lectures and seminars with synchronized and desynchronized contacts by Internet in order to control students' work and to organize their scientific activities.

Despite there are examples of practical implementation of virtual education and the publications on this field are many, it still remains a poor exploited terrain of the educational process. It passed too less time to multi-aspectual understand and appreciate this techno-pedagogical innovation.

[21] Chandler, A. *Strategy and structure.* Cambridge, MIT Press. – 1962, p.57
[22] Jinga J., *Managementul învăţământului*. Bucureşti: Editura ASE, 2003, p.148

A part of the teachers, conservator adepts, see the virtual education as auxiliary mean for the traditional education. Another part, the radical adepts, considers it as an alternative for the existent educational system.

From our regard, the task of virtual education doesn't consist in the demonstration of net superiority compared to other educational forms, but in the introduction of a new specter of performances needed for the inerrant changes is confronting the knowledge society in formation. We conceived it as ***a complementary form*** of education allowing, moreover, the optimizing of teacher's didactical task.

Consequently, if we are to refer to stationary education, we are closer to the position of conservator adepts but if we refer to the correspondence education, master or doctorate or lifelong education for the adults – we are close to the radical adepts' position.

Once the education technology is defined we pass to the research of the three basic compounds: methodical assessment, technical support and organizational assessment.

The methodical assessment of virtual education

If in the traditional form of education the teacher is the main spree of knowledge for the student, in the virtual education the knowledge and competencies are contained in **the electronic methodical-didactical set (keys)** send it to the student for every discipline scheduled in the plan of studies.

These keys usually include the following basic components:

1. Brief characterization of the discipline and the terms recommended for its acquiring;
2. Schedule of work and discipline;
3. Electronic handbook;
4. Methodical recommendations for the work with electronic handbook;
5. Glossary;
6. Thematic and methodical recommendations to accomplish the yearly theses, the control and practice papers, the independent work with corresponding examples;
7. List of supplementary bibliography and references to the Internet informational resources;
8. Subjects for colloquiums and exams with criteria of knowledge appreciation.

The main element of keys is represented by the **electronic handbook** that basically contains three basic compartments:

• Content of the discipline;

• Revision questions, exercises, problems, study cases, chrestomathies contributing to the consolidation of the learnt knowledge;

• Tests allowing the knowledge self-assessment.

This type of handbook is peculiarly effective when it:

• doesn't only visualize the text on the screen but thanks to the multimedia technologies inserts sound, graphic, video-sequences and animation;

• allows the quick finding of needed information;

• provides the interactivity meaning the inverse relation between student and teacher.

Also, the electronic handbooks accomplish a series of *requests* as:

1. The material exposed in the electronic handbook must correspond to the educational standards provisioned for the higher education system.

2. The content of the material must be well structured and presented in two versions: "Abstract" – the explanation of notions and basic interdependencies and "Full text". Such presentation of the didactic material is very accessible for the students because allows a targeted study (for example, if the student goal is to thoroughly learn the material, he will access the "Full text" and if he wants to refresh his knowledge before the exam, he will access the "Abstract").

3. The text must be followed in by multiple references to supplementary informational sources through hypertext links.

4. For the most important and intricate moments, the electronic handbook must contain along with the text, audio and video also the teacher's video-speeches underlining the main aspects.

5. The handbook must give the possibility to print text sequels needed to accomplish diverse papers.

Therefore, the electronic handbook isn't an exactly analogue of the published edition but proposes *a new paradigm to get the knowledge* by inner combination of pedagogical and informatics technologies.

The technical support of the virtual education

If the methodical assessment presumes to determine "what" and "how" to be learnt, the technical support aims the problems resolution generated by the use of the new info-communicational technologies. Their use isn't a goal itself but a mean to intensify and improve of the didactical process and it isn't less important then the methodical assessment because the content of a extraordinary course can remain unlearnt if the preponderant part of the time the student must confer to the work with a unsuitable interface of the software.

The technical support presumes the endowment of educational institution with the following interdependent basic components:

- Computers;
- Informational networks, access gates, Internet and Intranet;
- Software medium (operational systems, soft solutions to process data, communication programs, etc.).

One vital problem for the modern institutions is the possibility to gain access to the Internet from inside and, inversely, of the access of the Internet to the institution's resources. Owed to this fact, the institutions of education become the most important group of providers' clients because "the needs of huge traffic determines them to acquire some wide access packages but the new e-learning technologies by video-conference application rises these needs at higher level by triple enhancing the network's traffic"[23]. Consequently, when the virtual education is used, the providers become main subjects in the extern environment of the educational institution. But, the software is needed in order to correct and efficient use the available device. The software is a complex of programs making possible the human co-work with informatics means.

Our communication it's consecrated to the virtual education therefore we will refer peculiarly to the special programs of education. Mainly, these programs are designed to create and manage course the communication being effectuated only in the Internet space. Such complex software is favorable for the institution allowing the total control over the access to its courses and the minimization of costs with the distribution and protection of didactic material.

The use of education programs grants the following *possibilities:*

- *The corpus of education that contents:*
  - The formation of databases with all the information related to the undergoing of study process;
  - The establishment of sequences for study tasks;
  - The creation of e-courses;
  - The adaptation of didactical material for different levels of proficiency of students;
  - The correlation of program in relation to consumers' requests;
  - Consultations at distance;
  - Self-assessment;
  - Free chats and chats leaded by teachers;
  - Forum and FAQ page;
  - Teleconferences.
- *The testing at distance* with the provision of multifunctional testing and maintenance of graphic design of tests.
- *The monitoring* by maintaining the bimodal scheme (main center of virtual education – territorial centers) to conduct the process of on-line studies with the possibility to replicate databases from the territorial centers at the central database in order to assure the control and audit of territorial centers' activity.
- *The use of integrated methodical materials*

[23] Massy, J. *Quality and e-learning in Europe.* Summary report. 2002, p.36

- E-courses over the use of software complex;
- E-courses for professors needed to create electronic didactic materials;
- Courses for students regarding the use of client part.

But, there aren't rare the situations when the educational institution has its own requests and visions over the virtual education. Under this circumstances, it makes a special command addressed to the firms of software or engages specialists from outside for their specialized centers.

Anyway, "the standard solutions will never entirely satisfy the institutions of education because they prefer the widening of functionality and flexibility of the education programs"[24].

The mentioned programs are designed only for on-line education and this generates certain restrictions and expenses for their users and also for the institutions of education.

The organizational assessment

The virtual education presumes a certain way of interaction between teachers, students and info-communicational technologies as follows:

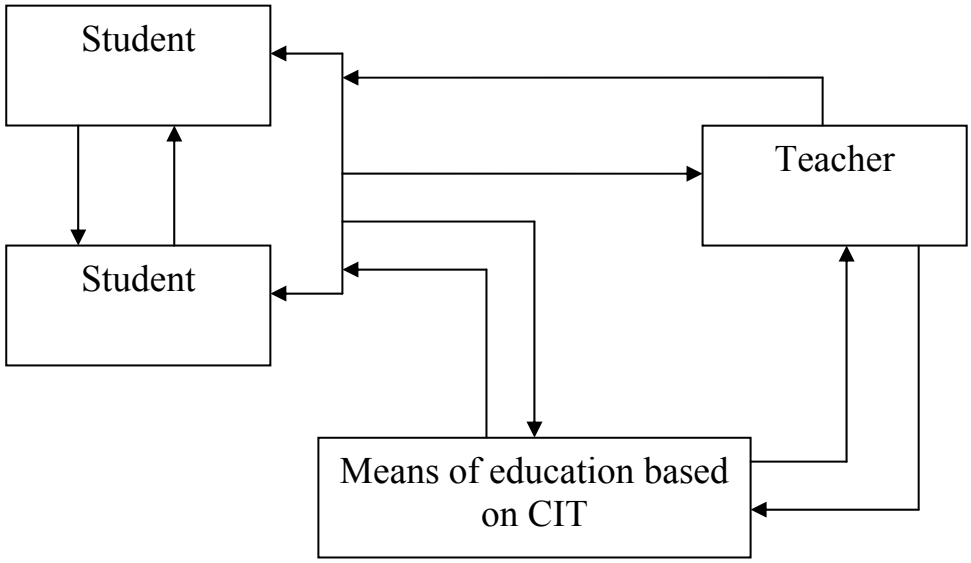

Figure 2. Interactions between the subjects of virtual education

This system of organization is based on the next *main principles:*

• *Accessibility*

Owed to CIT, "any user of the educational resources, teacher or student, can get anytime and anywhere information over the content, structure and work regime with the disciplinary keys and supplementary information for the educational process"[25]. Many persons will to learn virtually is explained by the fact it becomes modern and some peoples' impossibility to educate in the traditional way: they have full-time jobs, have handicaps, women rising children, militaries and their family members, persons dwelling in isolated regions, leaders of regional body, peoples from the plenipotentiary institutions.

• *Flexibility*

It presumes the possibility of modifications, completions and eliminations of some part of the information that is related to the content, structure and work regime with the educational resources. The need of these interventions stays in the moral depreciation of didactic materials and organizational

[24] Roceanu I, Barbieru D, Beligan D, *Using DRUPAL on educational project, International Conference on Distance Learning,* Simulation and Communication held at CATE 2009, MAY 06, Brno, Czech Republic, 2009.
[25] Roceanu I, Popescu M, Barbieru D, Toedt A, *The 14-th International Conference on Technology Supported Learning & Training proceedings*, Berlin, 2008.

measures proposed in the informational educational environment and also the enhancement of software and hardware.

• *Interactivity of subjects in the study process*

The teacher presence that attributes to the lesson a personal energetic is missing but is compensated in the virtual education by the interactive character of education that is done synchronized and unsynchronized. Consequently, in the virtual education the communication can be done by the following ways:

Types of communication	Means of communication	
	Sincron	Asincron
Communication between students	chat	e-mail
Communication between students and tutors of disciplines	chat	e-mail
Virtual seminars and conferences	on-line	forum conferences
Communication with the administrative tutor	chat	e-mail
Communication with the technical support group	chat	e-mail

In our vision, the process of organization of the virtual education system can be represented as seen below:

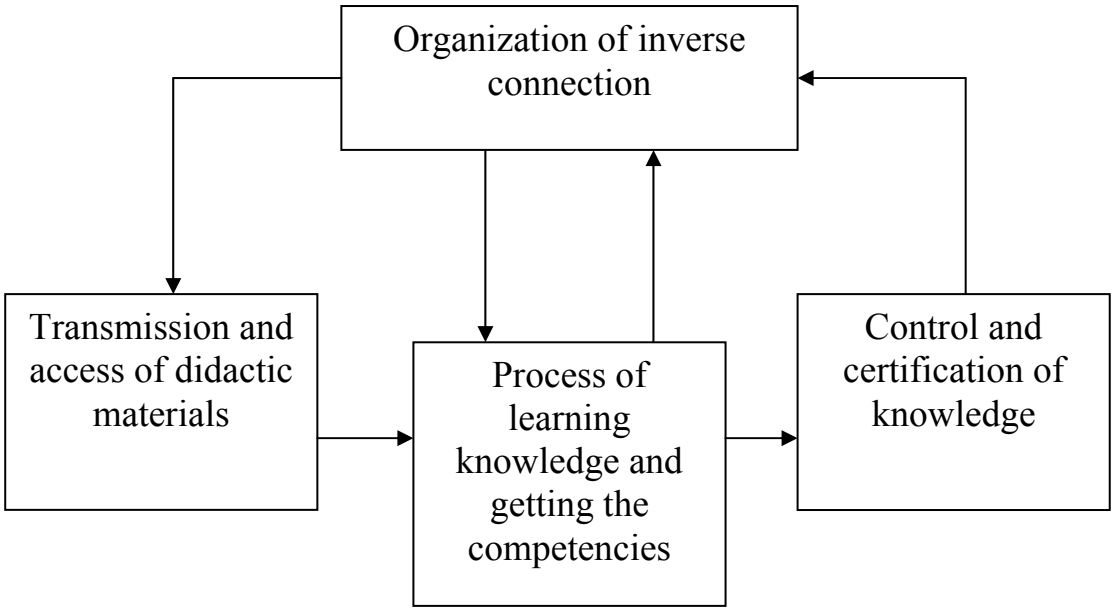

Figure 3. General scheme of the organization process of the virtual education

Let's further analyze every of the shown components:

- *Transmission and access of the didactic materials*

The transmission of keys with the didactic materials is done on Internet, Intranet or is distributed on disks if the volume of information is bigger. For the majority of high level education institutions the access to the courses is paid and needs a strict monitoring. The free courses rather present demonstrative or marketing issues. The payment to access the services is done yearly or for each course by electronic payments or account transfer.

- *Process of learning knowledge and getting competencies*

Knowledge and competencies will be able to be acquired only if the students will be trained in the regard of such education form. In order to really become "virtual" students they must got a series of aptitudes:

• to use correctly and quickly the technical means;

• to be able to work with the files and the disks' catalogues;
• to navigate in Windows, Word, Excel;
• to protect the computer from viruses;
• to know English in order to be able to read the HELP issue and TUTORIAL level literature;
• to use the electronic mail and exchange of information by network.

In order to compensate the effects of isolation into the virtual education framework, a peculiarly importance place in the process of acquiring knowledge it has the tutorial system.

- *Control and certification of knowledge*

Knowledge assessment can be done by three means: current self-assessment, periodical assessment by control papers and final examination.

The students do the self-assessment on the basis of self-control programs, inserted in the electronic handbooks but also supplementary transmitted at every month end (100-150 tests). The automatic system allows the determining of the level of knowledge acquiring and the students have the possibility to assess their own performances and to discover "the gaps" on knowledge. We must mention that for the self-assessment system becomes important not only to find the errors done in the tests but also is showed the correct answer with the needed explanations or with links to the corresponding material.

Also in the system of virtual education is taught in the most suitable days and hour, there exist the danger that without a rigorous self-organization, the will to succeed and a favorable social environment can be very easily to trespass from the free education to its abandon. In order to diminish these preconditions' negative effects, to organize more reasonably in time the efforts to acquire knowledge, the virtual education presumes the compulsory accomplishment of control papers which positive assessment conditions the access to exams.

The calculi prove that the optimal variable of efforts intensity of virtual education is assimilated to the accomplishment and doing two controlled papers at every 3 weeks. Therefore, all the papers settled in the educational program will be fulfilled in term and the student will be admitted to the examination session. In order to create conditions for qualitative fulfillment of control papers, every student for every discipline receives a pattern-paper to familiarize with the tasks and their fulfillment methodology. The quality of the papers is stimulated also with the general grade that is formed as fixed-ratio average of control paper (50%) and the final exam (50%).

The final test can be done electronically or in traditional form. The first reduces the costs with exams' organization and classes renting. The student knows immediately its acquired grade, the number of correct and wrong answers and the explanation of committed errors.

But the variant chosen in the majority of institutions is the traditional one, in the presence of the teacher. One of the causes is the total distrust in the existent informatics systems. Another problem is the identification of the person that sustains the exam. Also it can be used the access password method, in the virtual examination lacks the possibility to visualize the person that attends the final test.

Of course, in order to provide the visualization can be organized teleconferences but they presume supplementary costs. In the traditional form, the final test is written the papers being codified and done under the surveillance of certain persons (there's no way the course's professor to attend the exam). Afterwards, the papers are transmitted to be controlled to a group of teachers which using assessment criteria appreciate the quality of acquired knowledge and competencies. The control results are approved by the examination commission which can send the papers with negative grades to a repeated control.

At the end, we can add that virtual education can be done in many *organizational forms:*

• Institutions specialized in virtual education;
• Mixed institutions: education in traditional and virtual forms;
• Consortiums of university institutions.

The important changes that regard the world's economy reduce the traditional borders of time and space that, in the close past, limited the national high education system. The connection to the global circuit of values and knowledge doesn't presumes the unconditioned import of foreign patterns but others experience must be known in order to make a reasonable choose.

One of the objectives of educational reform is constituted by the integration of the national educational system in the European and global educational space. This determines the importance and necessity of knowledge but also of critical analysis of all is happening in the extra national educational space.

References

[1] Battezzati, L., Coulon, A. *E-learning for teachers and trainers*. Luxembourg: 2004
[2] Chandler, A. *Strategy and structure.* Cambridge, MIT Press. – 1962.
[3] Colin, C., Durand, E., *Le guide des formations a distance*, Paris : L'Etudiant, 2002
[4] Istrate, O. *Educație la distanță. Proiectarea materialelor*. Bucureşti: Agata, 2000.
[5] Jinga J., *Managementul învățământului*. Bucureşti: Editura ASE, 2003.
[6] Gutman, A. *What Counts as Quality in Education*
[7] Langree, O., Magne L. E-management. Paris: Dunod, 2001
[8] Massy, J. *Quality and e-learning in Europe.* Summary report. 2002
[9] Roceanu I, Barbieru D, Beligan D, 2009, *Using DRUPAL on educational project, International Conference on Distance Learning,* Simulation and Communication held at CATE 2009, MAY 06, Brno, Czech Republic
[10] Roceanu, I, Popescu, M, Barbieru, D, Toedt, A, *The 14-th International Conference on Technology Supported Learning&Training proceedings*, Berlin, 2008.
[11] Roceanu, Ion. *E-Learning - între teorie si practică*; În: Buletinul Universității Naționale de Apărare nr. 4/2004, Bucureşti, Editura Universitatea Națională de Apărare, 2004.