E-LEARNING PLATFORMS IN ROMANIAN HIGHER EDUCATION

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ABSTRACT: *Master's Degree Programs generally use specific e-learning methods as a complementary training. The University of Petrosani has a partnership with Siveco Romania in the IT field focusing on ERP systems and on e-learning platforms through AeL product. We selected two Master's Degree programmes due to the qualifications it provided on the labour market, for implementing an online master. The design of master's degree academic curricula in e-learning system will involve the curricular development, the designing of the learning resources with the help of the e-learning technology as well as the development and simulation of the instructive-educational web-based process; all these aspects using AeL which is a universal and integrated e-learning solution, offering facilities for the management and presentation of various types of educational content, such as multimedia interactive materials, simulations, and tests, covering a wide range of subjects.*

KEY WORDS: *e-Learning platform; project management; master's degree; virtual learning environment; learning management system*

JEL CLASSIFICATION: *I20, I23, I29*

1. INTRODUCTION

E-learning is naturally suited to distance learning and flexible learning, but can also be used in conjunction with face-to-face teaching, in which case the term Blended learning is commonly used. E-Learning pioneer Bernard Luskin argues that the "E" must be understood to have broad meaning if e-Learning is to be effective.

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must be understood to have broad meaning if e-Learning is to be effective (Anderson, 2000).

In higher education especially, the increasing tendency is to create a Virtual Learning Environment (VLE) (which is sometimes combined with a Management Information System (MIS) to create a Managed Learning Environment) in which all aspects of a course are handled through a consistent user interface standard throughout the institution. A growing number of physical universities, as well as newer online-only colleges, have begun to offer a select set of academic degree and certificate programs via the Internet at a wide range of levels and in a wide range of disciplines.

Another used concept is Learning Management System (LMS), which is a software application that uses a computer to organize courseware and track student records and progress. The Web-based training (WBT – a training delivered over the Internet) presented in figure 1, is often combined with LMS. Also CMI (Computer Managed Instruction) is another name for LMS.

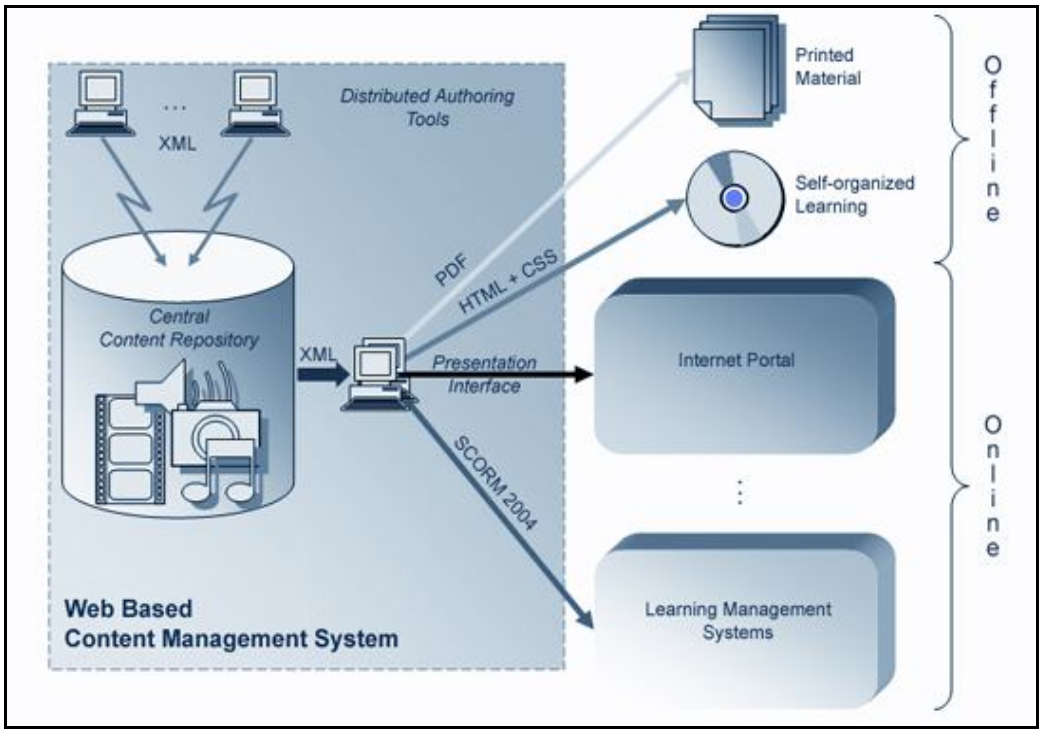

Figure 1. E-learning Environment

2. E-LEARNING SOLUTIONS IN HIGHER EDUCATION

On a worldwide level there are many professional e-learning platforms of which we can mention Blackboard, Web CT, Ariadne, Pearson Learning Studio, IBM Lotus Learning Space, Top Class, IntraLearn and eCollege.

WebCT (Course Tools) or Blackboard Learning System, now owned by Blackboard, is an online proprietary virtual learning environment system that is sold to colleges and other institutions and used in many campuses for e-learning. To their WebCT courses, instructors can add such tools as discussion boards, mail systems and live chat, along with content including documents and web pages. The latest versions of this software are now called Webcourses. WebCT is significant in that it was the world's first widely successful course management system for higher education. At its height, it was in use by over 10 million students in 80 countries.

Like WebCT, Blackboard is a web-based, interactive tool that University of Houston and University of Maryland instructors often use to deliver course information and material online. Your instructor may rely on Blackboard to communicate with you, deliver course materials, administer exams, or hold group sessions online. Blackboard is accessed through your web browser. It is easy to learn, and for students familiar with WebCT, it is very similar (www.umuc.edu).

Pearson Learning Studio combines the power of two existing platforms serving over nine million students worldwide, Pearson eCollege and Fronter, allowing institutions to create a flexible learning environment that best aligns with their academic mission and goals. Pearson LearningStudio offers three licensing levels (Campus, Blended, and Online) to create a customizable learning solution that grows with institutions as their needs evolve.

Hybrid courses are on-campus classes with a significant portion of the material offered electronically. Hybrid courses meet approximately half of the time in a traditional face-to-face classroom environment with the remainder of the course presentation, interaction, activities and exercises delivered through various electronic means, usually via Blackboard.

3. CURRENT STAGE OF USING THE E-LEARNING PLATFORMS IN ROMANIA

Taking into account the level of the implementation of the on-line education from 2000 in USA (92% of the large American organization have implemented E-learning platforms), the EU has tried to reduce the current disparity by adopting the Lisbon declaration. EU has developed an e-learning priority program, which became a key element for edifying the eEurope (European Knowledge Society).

In Romania the e-learning in higher education is regulated by provisions created in 2005 by CNEEA, and the Romanian education system complies with the European one. The e-learning system has been implemented in many Romanian universities, as for example the Bucharest Academy of Economic Studies (AES), the Gh. Asachi Technical University of Iasi, the University of Bucharest, (www.credis.ro/index1.asp), The University Babes Bolyai from Cluj-Napoca, The Technical University of Cluj-Napoca (The Virtual University of Cluj-Napoca, www.coned.utcluj.ro), as well as the West University of Timisoara and the Transylvania University of Brasov. The e-learning pioneering in introducing in 2004 the first on-line Master`s Degrees with a state diploma belongs to the National School of Political and Administrative Studies. The number of people who decided to use an

e-learning system has increased four times up to 2008, and this is shown by the number of on-line Master's Degree students from AES, that was 1100 students in 2007.

The Romanian software and the companies which offer support in designing and developing e-Learning platforms are AeL - Advanced e-learning (Siveco Romania S.A.), ASK e-learning (InsideMedia), eLearn (Timsoft Timisoara), Softwin and Expert Learning System.

4. AEL - AN INNOVATIVE, MODERN AND COMPLEMENTARY TOOL FOR EDUCATION

AeL is a universal and integrated e-learning solution, offering facilities for the management and presentation of various types of educational content, such as multimedia interactive materials, interactive guides, exercises, simulations, and tests (www.siveco.ro).

Over 15.000 schools from Europe, Middle East, Africa and CIS have already experienced the AeL e-learning solution. The extensive AeL eContent Library includes over 3.700 interactive lessons on 21 subjects, and over 16.000 reusable learning objects.

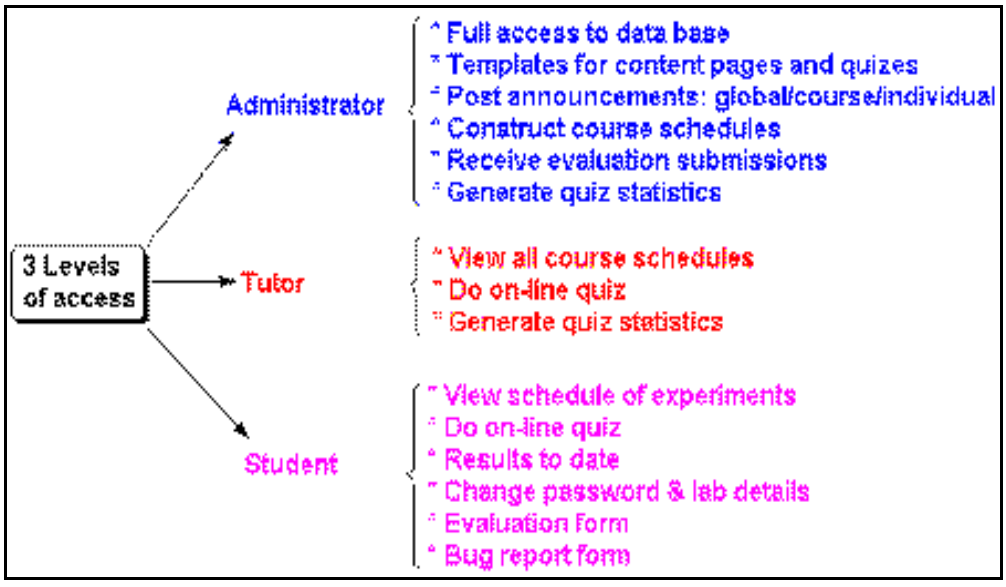

Figure 2. Participants in the educational process

AeL was developed as a support for the learning process in the classroom but also as a product for the future, portable on mobile devices, that offers students the opportunity to learn anywhere, anytime, with a 3 levels of access (see figure 2).

AeL e-learning solution is based on international principles and standards that support modern education, being designed as complementary tool to classical teaching/learning methods. AeL offers support for all participants in the educational process (students, teachers, administrative personnel, parents, civil society). AeL can be used successfully in the teaching and learning process, testing and evaluation,

educational content administration, monitoring the results of training and evaluation, education forecasting, trends and prognosis (Noveanu, 2009).

AeL is MathML (an application of XML), SVG and SCORM (a collection of standards and specifications for web-based e-learning) compatible, is perfectly adapted to the Romanian educational legislation, modularized, powerful and extremely flexible, thus can be customised and easily translated in any other language.

AeL is optimized for:

- Synchronous learning - the teacher controls the whole educational process, creating, adapting and monitoring the training;
- Asynchronous learning - students study at their own pace, enables collaborative projects;
- Testing and evaluation - meant to meet the needs of educational institutions and to measure the impact and effectiveness over the educational process.

SCORM 2004 introduces a complex idea called sequencing, which is a set of rules that specifies the order in which a learner may experience content objects. In simple terms, they constrain a learner to a fixed set of paths through the training material, permit the learner to "bookmark" their progress when taking breaks, and assure the acceptability of test scores achieved by the learner. The standard uses XML, and it is based on the results of work done by AICC, IMS Global, IEEE, and Ariadne.

Mathematical Markup Language (MathML) is an application of XML for describing mathematical notations and capturing both its structure and content. It aims at integrating mathematical formulae into World Wide Web documents.

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AeL eContent is an interactive multimedia e-content with the following characteristics:

Provides a greater control on the resources, both for students and teachers. The students are more implicated in the lesson development. They understand the possibilities given by the new technologies after having obtained control over them. They develop their capacities to plan, select, explore, to solve “real” problems in a virtual medium, they can monitor and evaluate their progress guided by teachers, fulfilling the goal of the modern pedagogy: student - centre of the education and, in the end, they develop new abilities and skills needed in their future adult life. The teachers are faced with a new challenge: they can/must control huge quantities of information and knowledge but they must learn to manage them, managing the outside resources is becoming more important than one’s own personal memorized/created knowledge. The success comes at the very moment when one’s personal specific didactic strategies are used to manage the resources.

The learning situations become more realistic and more authentic. The access to all kinds of resources needed in a specific learning situation and the accentuated implication of the students during the lesson through the interactive mode of the eContent lead to more authentic learning situations, the student must actively take part to the learning process, he/she is stimulated to constructively think, decide, create. At the same time the students can get information from data banks from different countries; images, descriptions and relevant statistics for the investigated problems, and the Internet communication assure some data or the collaboration to diverse projects. The students are taught "to deal" with real conjunctures rather than "learning about" them.

The instruction can be extended to the learning communities on-line, contributing to "fair chances" for everybody. The school units bound in the network assure new interaction models, extending the learning beyond the teacher and the manual. The possibilities of the results presentation and manipulation facilitate the collaboration with other users-students or local community members. The possibility of some collaboration projects with school or experts in the local community appears involving the children/young in the society real problems. And, most important, the flexible structure of the eContent, the global themes, the extreme ease in manipulation transform it in the ideal instrument for teaching in all special kind of situation: student in distant or disadvantaged regions, students with disabilities all are equal by the quality of teaching. Nor less important is the eContent potential to sustain the curriculum at school decision.

The teachers regard the eContent as the motive force for an educational reform. The usage of eContent determines a holistic approach to education, beginning even with questions about how finalities are elaborated, how the curriculum is conceived, the way in which the student interacts with the curriculum, and the mode in which the evaluation of educational process is done. This holistic impact on the learning systems could occur only in the conditions where ICT is used in an educational action based on the fundamental thesis "the student actively builds his/her knowledge", the eContent and the way it can be managed open a substantial path in solving this problem (Noveanu, 2009).

The eContent offers unlimited knowledge construction possibilities. Introducing computers into the educational practice occurred almost in parallel with three decades of research in the cognitive sciences field; in this period we extended our understanding about the way learning as a process takes place. Investigations in this domain put in evidence the fact that knowledge isn't passively received but it is actively built by the student, based on previous knowledge, attitudes, and values. Relying on a single information source, i.e. the textbook, limits the knowledge construction possibilities. eContent came as an answer offering a medium for study instead of a frame (Noveanu, 2009).

The educational eContent amplifies the student's interest and motivation by the diversity of the learning goals, projects, means and results. This fact is easily observed in school with regular children, all over the country; it is even more obvious in special learning units, where ICT includes special supports for students with disabilities. Not less important is the support for students with over the average

intelligence. Using and managing eContent has become a vital act of preparation for the "knowledge society".

5. SELECTING THE MASTER`S DEGREES TO BE IMPLEMENTED ON A E-LEARNING PLATFORM

The two Master's Degree Programs proposed to be implemented on a e-learning platform (Project Management and Information Technology Systems), currently draw through the relevant qualifications which they provide on the labour market, 20% of the total of Master Students who are learning in the Faculty of Mining and other 20% from the Faculty of Electrical and Mechanical Engineering. The two Master's Degrees have already been available for 6 respectively 4 years in these faculties.

These two Master's degree programmes could use the information and communication technologies in order to sustain the innovating initiatives in the higher education from Romania and this would definitely offer a growth of the quality of the educational act. In this way we could use principles which comply with the main European policies regarding the creation of the European Higher Education Area, for the e-learning and lifelong learning.

Like the online master's degrees in business, online master's degrees in Project Management are applicable to a variety of industries including large and small business, information technology, human resources, manufacturing, and more. An online master's degree in project management will focus on leadership and project planning.

Our example for the implementation of the on line Master's Degree in the field of Project Management was taken from the University of Maryland University College (UMUC). UMUC's online MBA program won the Instructional Technology Council's 2010 award for outstanding e-learning program and was recognized as the 2009 Distance Program of the Year by the IMS Global Learning Consortium.

The master's programme Information Technology Systems draws each year a high number of graduates from diploma programmes from different fields. The typical pattern of this master program is perfectly compatible with the e-learning platform.

Taking into account both the desire of spatial expansion by enlarging the geographical area of the future master students, and the need of using the ICT in the educational master programmes, we considered highly important to implement an e-learning platform in the University of Petroşani.

6. CREATING LEARNING OBJECTS (LO)

Advancing technology is expanding the boundaries of what is possible in education. The increased use of personal computers and Internet connectivity has prompted increasing research and production of computer based learning systems. One of the most important of these trends is the development of relatively small, self-contained, reusable learning objects.

Traditional instructional content is created with a specific audience and educational circumstance in mind. Reusable learning objects, on the other hand, are instructional software modules created to be used in a variety of educational settings.

Learning objects have a number of key advantages over standard courseware. First, creating small, targeted, modules allows flexibility in constructing courses from a number of smaller objects. Secondly, because each object is smaller, it can be used in a number of different circumstances, and therefore by a greater number of users. Because of this increased audience, designers should be able to invest greater resources in maximizing the effectiveness of each learning object. An example of learning objects is presented in figure 3.

The Design of LO. Successful design begins with a needs assessment to determine what knowledge or skills are required by the learner. This may include a task analysis to distinguish critical information and learning prerequisites. The designer can then use this information to create individual learner objectives. Often, the designer will design a separate learning object for each discrete objective. Individual objectives should be classified by learning types such as concept, fact, principle, or procedure. This taxonomy, as defined by Ruth Clark, allows targeting of optimal design strategies to different types of instruction. Individual learning objects can then be grouped together to address specific real life tasks, and a design specification can be created to guide development (Holotescu, 2004).

The Development of LO. We can use almost any development tools that create digital media, including PowerPoint, Photoshop, Dreamweaver, or custom creation tools. Learning objects should normally include content, practice, and assessment sections. In this stage text, graphics, video and other content are built and combined to create the individual learning objects. Alpha and beta tests should also be conducted to ensure that the content created meets the initial needs assessments (Holotescu, 2004).

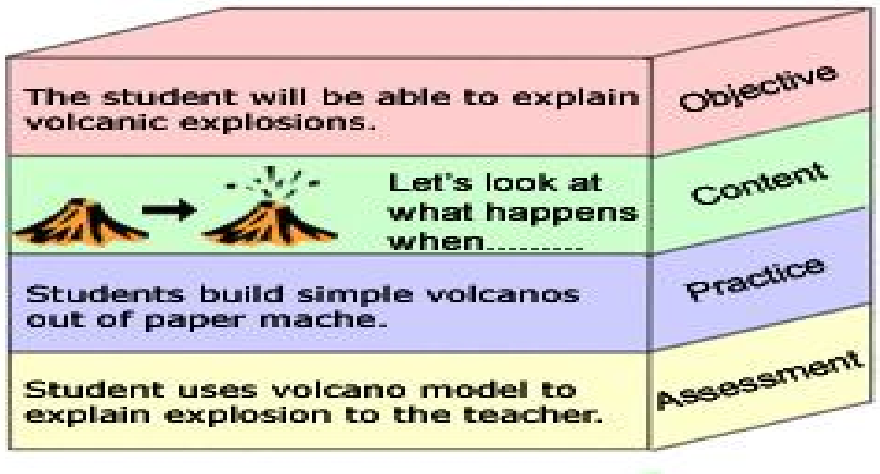

Figure 3. Example of learning object developed to teach elementary students about volcanos

7. DESIGNING AND IMPLEMENTING AN E-LEARNING PLATFORM FOR E-MASTER IN THE UNIVERSITY OF PETROŞANI IN THE FIELD OF PROJECT MANAGEMENT (PM) AND INFORMATION TECHNOLOGY SYSTEMS (ITS)

The e-learning platform for e-master is in line with the reform initiative in the Romanian educational system and intends to make the best use of the opportunities offered by the information and communication technology in the educational area. The educational system may fully benefit from the advantages of the e-learning system through:

- asynchrony learning, leaving the students the freedom to decide the learning rhythm;
- student-oriented learning, allowing a better control of the latter upon the learning curricula;
- multimedia integration, using the opportunities offered by the information technology;
- on-line exams, thus maximizing the learning efficiency and resource usage;
- on-line libraries, concentrating the knowledge in a relevant way by connecting the locale and global resources (Internet).

The e-learning platform which will provide the functionality of the training process of the master students is structurally built of a series of modules:

- Digital library which reunites the framework of the courses for each discipline included in the curricula of the master program.
- Self-assessment test modules which are structured on disciplines and offer the student the possibility of a self and objective evaluation. Such tests can be found at the end of each lesson or after each chapter, being differentiated according to the degree of difficulty, answer times, etc. The advantage of using these self-assessment techniques is firstly related to the psychological and motivational factors, the student taking advantage of a ”cozy” environment (the student and the computer) in order to test the level of the knowledge.
- Evaluation tests, also grouped according to each discipline, allow through a flexible process which eliminates certain classical restrictions of the examination activities.

The activities which make up an implementation project of a e-learning platform for the Master’s Degree are (eMaster, 2008):

1. Project management

2. Curriculum designing

2.1 Researches and studies on the definition and elaboration of the conceptual model ”Complementary Master’s Degree for the labour market”;

2.2 Documenting and collecting information regarding the characteristics of ”the universities on the labour market” especially for the second cycle in the Bologna System (complimentary Master’s Degree) in a e-learning system which can provide the growth of the qualitative level;

2.3 The analysis of the methodological, pedagogical and procedural aspects of delivering the on-line training services in a double European coordination;

2.4 Designing the web page of the project;

2.5 Creating a curriculum for the master program on the basis of the procedures characteristic for the online master's degrees;

2.7 Developing the scientific content, according to a defined curriculum for the courses of the master's degree program;

2.8 Dissemination activities: experience exchange on the theme of theories and methodologies of defining and developing a curriculum and of using ICT in education;

3. Creating e-learning technology learning resources;

3.1 Providing a minimal infrastructure (hardware, software, connectivity, maintenance) for the implementation of a e-learning platform for the master`s program;

3.2 Providing the necessary software infrastructure for the teaching/learning activities by installing and configuration an integrated training and management platform of the digital educational content;

3.4 Lifelong training of the teaching staff in order to use the ICT in the educational management and to acquire the teaching methodology using the e-learning technology ("eLearning pedagogical" elements);

4. Developing, testing and simulating the web-based training educational process;

4.1 Creating the digital content of the courses from the master curriculum;

4.2 Selecting the scientific content and setting the elements which are going to be digitalized;

4.3 Setting the degree of interaction for the selected contents elements, in order to reproduce as close and as suggestive as possible the concepts, the processes and the phenomena which represent the object of study of the courses;

4.4 Pedagogical design of the scripts;

4.5 Creating eContent based on the scripts;

4.6 Training the technical staff (system administrators) to create the capacity of administrating and using the e-learning platform and training the teaching staff on the management of the digital course objects;

5. Pilot project - Master's Degree Program

5.1 Pilot courses in digital format, for a semester, for the first year of study, using the e-learning technology;

5.2 Monitoring the results and the analysis of the impact of using the e-learning technology in the teaching/learning activities;

5.3 Optimizing the instructive-educational process based on interactive teaching methods and digital learning content, by collecting feedback and implementing improvement measures on a curriculum level, course contents, teaching methodology, in order to improve the future results;

5.4 The second online master program under double coordination;

The teaching process and the teacher-student interaction are carried out through an e-learning platform which will offer the following facilities:

- Online examination system;
- Forum on discussion themes and frequently asked questions;
- Online system of solving the projects and applications;

- Online system for the assessment of the projects, applications, exercises, tests;
- Electronic information processing system related to: the attendance of the students to the online courses and seminars, the progress registered by each student; the situation of the papers and of the applications.

The online master's degree programmes are accessible for all those people who have access to a computer connected to the Internet, and the attendance of the courses and of the seminars does not involve the interruption of the professional activity or the movement of the student from one place to another (eMaster, 2008).

Training the master students in an e-learning system does not exclude the "face to face" meetings between the student and the tutor. The master program includes for each discipline from the university curricula tutorial activities with the purpose of discussing issues on the materials which have been read by the students and also workshops with a strong practical character where real cases from the speciality field can be discussed.

The assessment of the results of implementing the project has two components:

- Quantitative: a) regarding the growth of the number of master students (engineers, economists engineers or other categories of people from related fields) b) regarding the number of the graduates absorbed on the labour market in fields and areas corresponding to the master program;
- Qualitative regarding the level of improving the labour force in the field of electrical, informational engineering, business and management field for the growth of the employment level on the labour market.

The academic curricula will include a package of disciplines dedicated to the entrepreneurial development of the master students. Modern methods will be promoted: learning based on problems and projects, collaboration, creativity, adaptability, inter-cultural communication. The program will be flexible and will be able to adapt to the labour market.

So we can assess that the entrepreneurial education in the higher education is a less systemic process than in the case of the pre-university education.

8. CONCLUDING REMARKS

The curricula designed for the online Master corresponds to the main training and improvement objective of the highly qualified human resources, in correlation with the CSNR objectives 2007-2013 regarding the efficient development and use of the human capital in Romania (eMaster, 2008).

We can mention some of the advantages of the online master: same academic curricula as for the full time education; development of the personal abilities; new perspectives of promoting; easily accessible courses, published on the Internet; interactive communication in the online campus.

The implementation of the online Master Program will create a flexible and highly qualified labour force which could be adapted to the constant changes on the labour market.

The advantages of using an e-learning platform in the master education are transposed in:

- The growth of the quality of the teaching process for the integration of the student on the labour market;
- The growth of the educational act;
- The growth of the learning motivation of the master students by leaving out the time and space barriers and increasing the access to the learning content;
- Increasing the internal efficiency of the university reflected in improved results, higher graduation rates.
- Efficient monitoring of the teaching process by exploiting the tracking and control facilities made available by the implemented electronic solution.

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