# E-learning platform used in Romanian students' teaching activities

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*Abstract:* - In recent years, information and communications technology has led to a real revolution in the field of computer-aided learning.Due to the changes in technology and the progress of the technology, but also on the globalization trend of education, new perspectives for education have been opened.For this reason, education was supplemented with new methods of teaching-learning and evaluation, these methods being specific to the information society. The global knowledge society has imposed Romanian Universities the use of Information and Communication Technology as a reference point for substantive changes in education system, and the challenges first emerged in three major areas: provision of universities, teachers training and providing the necessary resources.It has been shown that e-learning and information and communication technology can improve the educational process. For this reason, most of the Romanian higher education units have abandoned traditional teaching methods. In our universities we aim to ensure quality in education, lifelong learning and professionalization of teaching. In this sense, the need for fundamental training in the theoretical and pedagogical field is essential in order to build transferable skills and to build some mentality (rethinking learning strategies with the help of information technology). In students' computer-assisted training, practicing is effective in forming elementary skills, while tutorial systems are more effective in forming higher-level intellectual skills of students. In my study, I used a new training platform to perform a simulation in a session of e-learning lessons.The new e-learning platform provides support for teaching, learning, testing and evaluation, managing, managing digital content, and monitoring the entire students' educational process.

*Key-Words:* - advanced eLearning platform; computer-assisted training, virtual class.

## 1 Introduction

The aim of the paper is to present a new training platform to perform a simulation in a session of e-learning lessons. This e-learning platform provides support for entire students' educational process in the field of teaching, learning, testing and evaluation, managing, managing digital content and monitoring.

Due to the changes in technology and the progress of the technology, but also on the globalization trends of education, new perspectives for education have been opened. For this reason, higher education has been supplemented with new methods of teaching-learning and evaluation, these methods being specific to the information society. These methods originally used e-learning only as a simple term for the development of an electronic environment, but more than just an experiment. It has now turned out that e-learning and information and communication technology can improve the educational process, which is why most educational units have abandoned traditional teaching methods. E-learning offers many advantages due to the possibility of continuous training and applicability in the most diverse domains, proving that in recent years there has been a continuous increase in the use of e-learning.

## 2 Educational softwares

Educational software is a complex computer program designed to be used in the teaching-learning and assessment process. The educational form of a manual can also be considered educational software, if it is in the form of an interface that allows an interactive way of working. Educational software must ensure the need for information,

attract through presentation, can provide interaction between the teacher and the computer and between the student and the computer. Educational software means a program designed with respect to pedagogical coordinates, behavioral objectives and specific content by ensuring individualized interaction, formative assessment, and sequential feedback. Educational software is a program that is used in the teaching-learning and evaluation process.

Educational software and multimedia technologies provide the user with various combinations, picture, sound, voice, video, animation, while hypermedia technologies (HM) combine multimedia with hypertext, making it easy to navigate between different types of data: texts, sounds and fixed images.Another feature of the educational software is the presence of a pedagogical strategy that, through student-student interaction, can give it information and work tasks capable of producing learning. In order to make these teaching-learning-evaluation activities more efficient, we meet several types of software:

a) *Interactive software.* Interactive educational software is used in lessons of teaching new knowledge. They create a dialogue between the teacher and the program. Interaction can be controlled by computer or teacher.

b) *Simulation software.* These softwares allow the controlled representation of a real phenomenon or system through a model with analog behavior. In this way, it is possible to modify some parameters and to observe how the behavior of the system changes.

c) *Training software.* These softwares allow the users to acquire data, procedures and techniques or to form specific skills which are conducted through exercise software.These help the teacher to do the exercise activities, each student being able to work at his own pace and always have the appreciation of the correctness of the given answer.

d) *Knowledge testing software.* They depend on several factors - test time, test purpose, interaction typology, if is done immediately or not.The result of the evaluation of these tests is displayed at the end of the test and ensures that the student's attention is re-focused on the incorrect elements of the respons.

e) *Interactive games.* These interactive games are software that is in the form of a game, reaching a goal, applying a set of rules - involves the student in a problem-solving process.A simulation of a real phenomenon is usually done, giving the student various ways to influence the achievement of the goal. Didactic play is an educational method in which simulated teaching is predominant.

This education software classification reflects the variety of instructional-educational activities in which it is useful and necessary to use the computer as a means of education.

# 3 Advanced e-learning systems

The term e-learning is meant the totality of educational situations in which the means of information and communication technology are used. The semantic area of the e-learning concept interferes and overlaps with a multitude of terms that capture the variety of didactical experiences benefiting from technological support: computer-aided training, computer-assisted training / digital / mobile / online learning / educational/ multimedia training, etc. Under the name of educational software, a wide range of electronic materials are developed to simplify the education process: maps, dictionaries, encyclopedias, teaching movies, presentations in various formats, electronic books, tests, tutorials, simulations, exercise software, educational games, etc. The computer, electronic and multimedia materials are used as support in teaching-learning and evaluation or as a means of communicationas. E-learning is also a type of distance education. Mediation is achieved through information and communication technologies, especially through the Internet. The Internet is both the material distribution environment and the communication channel between the people involved. Functionally, the Internet training system adapts to the components of traditional didactic approach: planning, specific content and methodology, interaction, support and evaluation. The e-learning system is a new way to look at the learning process. In fact, the elements remain the same, only the means of exchanging and acquiring knowledge is changing. The use of the computer system for training is actually the appearance of new elements, such as the freedom to learn at the place and at the desired time. This concept of e-learning has taken over many of the traditional teaching elements, so these principles have been developed over many centuries and are part of what people think about teaching and learning. A characterization of e-learning can be based on certain concepts such as:- -the learning process is directed to the trained persons and is done in a virtual location;

- educational resources are accessible on the Web and distributed (using, integrating, accessing electronic libraries and multimedia materials, and engaging specialists in discussions);
- trained people benefit from the orientation of a teacher who plans the work of the group of

participants, discusses aspects of the course with asynchronous conferences, discussion forums, blogs or synchronous, chat, virtual class, provides auxiliary resources, comments the lessons; - through interaction and collaboration, the group of participants is formed during the course and also after a virtual community;-the course material has a static component, teacher-ready component and a dynamic component, resulting from the interaction of the participants, the suggestions, the comments, the resources provided by the participants; - Most e-learning environments can monitor the activity of participants, and some can simulate group work, audio and video interactions.

## 3.1 AEL platform installation – a new training platform to perform a simulation in a session of e-learning lessons

The AeL e-learning platform provides support for teaching, learning, testing and evaluation, managing digital content and monitoring the entire educational process.AeL is optimized for:
-synchronous learning - the teacher controls the whole educational process by creating, adapting and monitoring the learning environment;
-asynchronous learning - the study takes place in the students' personal rhythm and involves collaborative projects;
-testing and evaluation - to meet the needs of educational institutions to measure the impact and effectiveness of the learning process;
The main advantages of using AeL platform in teaching, learning and evaluation are:
- supporting the teaching process through modern computer tools, providing teachers with a flexible and efficient platform.
- monitoring the educational process and of the results obtained by the students', both during school year and after its completion.
-an efficient resource planning
-improving the learning process.
-increasing the receptivity and the degree of knowledge assimilation.
- the creativity and competition stimulation of the individual and team work.
- the possibility of simulating phenomena as a substitute for costly or difficult to buy materials and teaching tools;
- the shift from traditional learning based on mechanical memory of information to experiment-based learning and discovery.
The AeL system contains a number of registered users, including:

-the Oracle Database Administrator - who creates the structure of the education unit on systems, classes, subjects, learning units;
-the person who is entering the data into the database: students' classes and personal data, supervisors, schedule;
-the supervisors - those who manage the classes in the database;
-the teachers, those who give scores to classrooms, drop absences and perform lessons presented through AeL;
- students who are actively participating in teacher lessons.
*Programs required installing the platform*: The installation program consists of two components:
1Installing the AeL server: Install the ORACLE database; Install the application server; Configure some server application parameters.
2. Installing the client application: Installing JRE (Java Runtime Environment), Installing Acrobate Reader, VRML (Virtual Reality Modeling Language), Installing "hotfix" for Windows 7, Installing necessary components for the application (ActiveX controls, NetMeeting, etc.), Configure some clients application parameters.
*System requirements* For a correct installation of the programs, it should be checked before the installation that the system meets certain conditions: Virtual Memory$> = 1024$ Mb; If the value of the parameter "NLS_LANG" is correctly assigned and the condition <NLS_LANG = .UTF8> is checked;
Verify if Oracle has previously been installed on your computer, AeL version 3.2; Installing Oracle Server for AeL version 3, for the new AeL version Windows Server is installed.
Oracle servers have been designed to deliver maximum performance, simplified management, high availability and economic efficiency. These systems include integrated virtualization, cloud management, and system management, are optimized to run Oracle Solaris, Oracle Linux, Oracle VM, and Oracle Enterprise Manager Ops Center. In addition, these servers support software for Oracle and non-Oracle applications and solutions. After installing the Oracle server, if JDK is not already installed on the server, you must install it.
The JDK development environment contains the following Sun JDK components:
**-java javac** compiler, it compiles the Java source code into the Java bytecode code;
**-appletviewer,** it is the component for viewing gadgets, reads an HTML document, downloads the gadgets referenced in the document, and displays

them in a window. It is used as an alternative to the web browser for testing Java applets;
-the Java code java interpreter, java, which is the engine running Java applications;
-the HTML document source generator based on the Java source code is **javadoc**.

### 3.2 AeL application overview

The AeL application is a modern computer-assisted training and management system for computer-aided learning, and can be used for other course methods such as distance learning or non-assisted training. The AeL application is a multi-layer system, using a non-consuming, web-based browser connected to a web server and Java-written applications. It uses state-of-the-art technologies such as Enterprise Java Beans, jdbc, Java, servlets, jsp-s, Java applets, and intensive XML. It has a content reuse concept that is based on XML wrapper description formats, and the necessary elements to import and export the required elements according to MathMl, SCORM, and IMS standards are implemented. AeL is an open system; the information is in line with existing, dynamic, expandable standards. Through the benefits of school textbooks and other study materials, the system aims, among other things:
**-**Attractive presentation of the lessons by using: interactive electronic textbooks; tutorials, demonstrations, video documentation; exercises, problem solving; simulations; educational games.
- Enhance the learning process.
- Increasing receptivity and assimilation of students' knowledge.
- Timely monitoring of teaching or administrative measures.
- Testing the effectiveness of new learning methods.
- Links with subjects related to the topics addressed.
- Extend the manual and study materials database by updating it with the latest versions of existing textbooks and study materials.
The AeL system aims to: Supports the teaching / learning process through modern IT tools; Facilitate the learning process; Stimulate creativity and competition, but also teamwork; Supplement traditional teaching methods with new technologies; Use simulation software as a substitute for expensive and difficult to acquire materials and teaching tools.
AeL is developed to provide strong support to responsible decision makers in the field of: planning, forecasting, tracking and forecasting.
- Monitoring performance and activity at university and even teacher level

- Collecting coherent information based on the synthesis of system data for both short and medium-term managerial decisions and long-term policy and strategy;
*Hardware Components:* The computerized laboratory consists of 25 workstations, a server, a scanner, networking equipment, and the Internet.The computers are configured by the manufacturer
AeL general characteristics:
- Friendly, easy-to-use interface, differentiated on roles, groups, access rights;
- Roles, groups, users, and access privileges associated with them are very easy to manage;
-Based on standards: AeL is compatible with MathML, SCORM and IMS;
- Easy to install and manage;
- Multilingual and regional support with basic operating software: Win32, email server, firewall and anti-virus software.

## 4 Simulations using the AeL application

SM - AeL School Manager (Secretariat) provides the opportunity to manage information about students, teachers, classes, school organization, and statistics. It consists of 6 menus, which contain submenus to help insert, view, delete information in / from the database:
- Schedule: allows managing the school curriculum of the whole school
- Classes: are associated with the educational unit to which they belong and, as a result, have particular characteristics;
- Students: provide all the data of students enrolled in the school unit; also includes the scores book
- Teachers: Provides all the data to the teachers in that school unit
- Organization definition: provides information on the school organization of the school unit;
- Statistics: with this menu you can obtain statistics related to scores, absences, and school years - at the students or class level.

### 4.1 Entering the AeL virtual class

The AeL application simulation was done after the generic period, the 2016-2017 academic year was added, the classes were configured, the teachers 'and students' database updated with the help of the ASM Secretariat.With the help of the ASM Secretariat, data has been entered and updated on the teaching staff using this application. In the ASM secretariat, the list of generic period's submenu has been

introduced the 2016-2017 academic years and the 2 semesters.The connection to the AeL application was made through a user name and a password; they were entered into the Secretariat. In order to enter the AeL application you must be a teacher or a student. Connection to the application can be done only after a server computer or client computer students.

## 4.2 Simulation of Memory Unit Lesson

Simulation of the "Memory Unit Lesson" is recommended for two hours of teaching and is made up of three parts: Logical Organization, Physical Organization and the Game (Fig. 1, Fig.2, Fig.3).



Fig. 1 Logical organization



Fig, 2.Physical organization - RAM memory
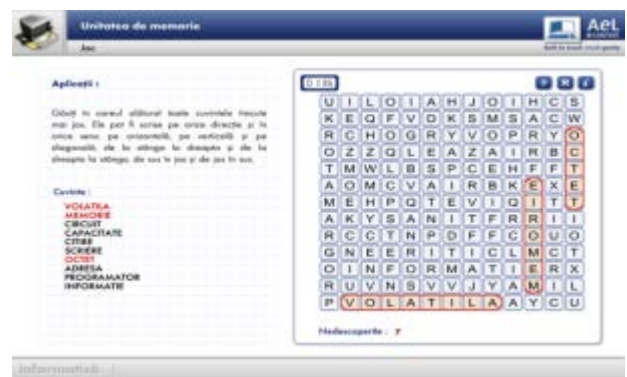


Fig. 2.Physical organization - RAM memory



Fig. 4.Completing the crossword puzzle

In Fig. 4 each student (user) is completing the crossword puzzle and then is validating the answers. After the completion of the Training, a summative assessment is carried out which includes: qualitative and quantitative testing of the student's learning of the subject matter; making decisions about accrediting the student's accumulated knowledge, continuing at an advanced level of the learning and training process, or remediating knowledge that is insufficiently or mistakenly accumulated and understood by the student.



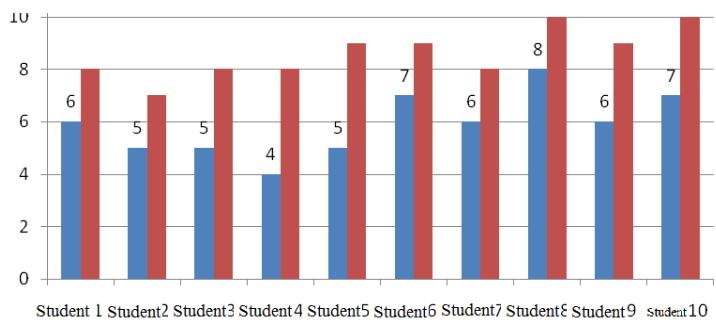Fig. 5 The recapitulative test with all the correct answers



Fig. 6. Comparative chart of notes received using traditional and modern methods

The interactive digital version of the Ael platform is designed in an attractive, modern way and streamlines the current assessment process (Fig. 5).Following the application of these methods, we came to the conclusion that the teacher should explain, exemplify the lesson and not criticize the students, encourage them to improve their knowledge next time.In Fig. 6, the scores represented with blue color are achieved with traditional teaching methods and red-colored scores are achieved with the modern teaching method.

In the case of the modern teaching method, an increase in scores can be observed due to recapitulative tests that take place at the end of the class time for fixing knowledge.

## 5    Conclusion

The modern teaching method with the AeL platform involves teaching a lesson, after which the knowledge accumulated through an assessment is fixed, thus both the student and the teacher can check the problems.After applying this method, we came to the conclusion that the teacher should explain, exemplify the lesson and not criticize the students, encourage them to improve their knowledge next time.To test the AeL application, the preconditions have been checked, all the necessary programs have been installed.The ASM Secretariat for this school year has been set up by entering all the necessary data: the generic period, the school year 2016-2017, the classes were configured, the teachers ', the students' database has been updated.The year of study, the class, the lesson, and the virtual class were selected for entry into the virtual classroom. Both AeL implicit lessons and other lessons have been used. Another lesson, "The Components of a Computer" is consisting of: computer notion, computer components and a recapitulative test has been created, is not an AeL implicit lesson.

*References:*

[1]   Jose Joaquin,,*Globalization, Education, and the Technological Revolution.* PROSPECTS - quarterly review of comparative education, International Bureau of Education, UNESCO Journals, 2001

[2]   Adăscăliţei, Adrian*, Instruire Asistată de Calculator, IAC. Proiectarea Instruirii utilizând Sisteme Informatice Multimedia,* http://iota.ee.tuiasi.ro/~aadascal/curs_iac/IAC_manl_idd2k5.pdf.

[3] Brut, Mihaela, *Instrumente pentru E-Learning. Ghidul informatic al profesorului modern*, Iaşi, Ed. Polirom, 2006,

[4] Cucoş Constantin 2006, *Informatizarea în educaţie. Aspecte ale virtualizării formării,* Iaşi, Ed. Polirom

[5] Oprea, Crenguţa-Lăcrămioara ,2006, *Strategii didactice interactive*, Bucureşti, Ed. Didactică şi Pedagogică,2006.

[6]  Roşca, Ion Gh.(coord.), *Informatica instruirii*, Bucureşti,  Ed. Economică 2002,

[7] SIVECO Romania, *Programul naţional de informatizare a învăţământului preuniversitar românesc*, 2010,

[8] *AEL – Manual de utilizare*