Comparison of E-Learning Platforms

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Abstract: In the past few years many new e-learning platforms have been developed. Each new teaching tool presents its own learning model. How to compare different e-learning platforms and on what basis to choose the most adequate one, is a task of ever increasing importance.
This paper presents the results of the comparison of three most popular e-learning platforms (Claroline 1.5.3, CourseWork and WebCT 4.0) with the e-learning platform Virtual Classroom, which was developed at the Polytechnical College in Subotica. The comparison is based on various pedagogical and technical aspects.

Keywords: e-learning, web application, distance learning.

1 Introduction

These days one of the most frequently used phrases besides ‘e-learning’ is a "life-long learning". It is becoming a more and more current topic because of our fast-moving society, and its constant development and changes brought on by the new information technologies. The concept means that there is demand for constant learning throughout one’s life time, and also means that from a professional point of view it is almost obligatory to be continuously looking for some new knowledge.

So, the participant of modern society needs not only to be well educated, but also to have a good education system, which makes possible autonomous learning, training, and change of occupation. The old education system cannot meet these new demands, and this is one of the reasons that the ‘online learning’, ‘distance learning’ and ‘e-learning’ are integral parts of our education and way of life.

In a past few years many new e-learning platforms were developed. All of them present different solutions for a new learning model. But a question must be asked: "How do you rate and compare and based on which criteria do you choose the adequate e-learning platform?

The characteristics which must be analyzed and compared in the process of e-learning platform selection must be from the aspects of functionality and how can it be useful in various communities with different cultural and social conditions. A simple technical system analysis is not enough. It is important to understand what principles have led the creators of the system, and how it will be implemented in the existing learning model. So, the analysis must also be done from pedagogical aspects.

This paper presents the results of the comparison of three most popular e-learning platforms (Claroline 1.5.3, CourseWork and WebCT 4.0) with the e-learning platform Virtual Classroom (VirtualCR), which was developed at the Polytechnical College in Subotica. The comparison is based on both pedagogical and technical aspects.

2 Methods

The comparison of these four e-learning platforms was made according to criteria suggested by the EduTools community.

2.1 The Pedagogical Aspects of Comparison

The modern trends in education are well described in the researches of Piaget and Bruner: for successful learning it is important to grant autonomous learning, self-motivation, self-testing, direct contact and active dialog with the instructor. Besides these, there is a demand for active participation in the process of problem solving, and to create one’s own opinion. This can be done in the following ways:

- Student's autonomy
- Urge students to take the initiative
- Active communication between the participants
- Constant feedback
- Selecting "good and attractive" learning contents for students
- Organize the contents in a spiral, so the students can always add new knowledge to the existing.

2.2 Technical Aspects of Comparison

- The best solution must be realized in multi-layer hierarchy and it must be a web-based application
- To have no additional software installation on the client's computer
- Not to demand a higher level of informatics knowledge from users
- To run on average computer
- Compatibility with the existing standards
- The reuse of lectures, exams, group etc.
- To have a search option
- To have easy and fast access to contents
- Fast and easy refreshing and contents changing
- Low costs of the system and its maintenance

3 The Comparison

The comparison of these four e-learning platforms was done in 7 sections: "communication tools", "productivity tools", "Joining the group and tools for animating", "Administration tools", "Presentation tools and lectures distribution", "Software requirements", "Price".

3.1 Communication Tools

Forum

Cleroline	The discussions can be sorted according to the date of creation
CourseWork	NA
WebCT 4.0 CE	The discussions can be sorted according to the date of creation and title. The instructor can determine the level of involvement: reading, writing or adding anonymous posts. The instruktor can create separate environments specifically for small groups. The posts may include attachments and URL.
VirtualCR	The system uses external forum.

File exchange

Cleroline	Students can upload files to the shared folders

CourseWork	Students can check their tasks, and download the syllabus and curricula
WebCT 4.0 CE	Students can check their tasks, and upload files to the shared folders
VirtualCR	The system does not support the file exchange

Internal e-mail	
Cleroline	Students must have external e-mail
CourseWork	Instructor can have internal, but the users must have external e-mail
WebCT 4.0 CE	Students can use all options of the internal e-mail: check their tasks, and upload files to the shared folders
VirtualCR	Students must have external e-mail

Online comments	
Cleroline	None
CourseWork	None
WebCT 4.0 CE	Students can write comments on every page. Later, those comments can be printed with the contents.
VirtualCR	None

Real-time chat	
Cleroline	Simply chat system, no private messages. Every activity is logged.
CourseWork	None
WebCT 4.0 CE	Chat public and with private messages. Every activity is logged. There can be 4 simultaneous discussion groups.
VirtualCR	External chat servers are available

Video service	
Cleroline	None
CourseWork	None
WebCT 4.0 CE	None
VirtualCR	None

Message board	
Cleroline	None
CourseWork	None
WebCT 4.0 CE	Yes
VirtualCR	None

3.2 Productivity Tools

Bookmarks	
Cleroline	None

CourseWork	None
WebCT 4.0 CE	The students can place bookmarks
VirtualCR	None

Calendar and progress watch	
Cleroline	The instructor can place events and notifications into the online calendar. Students do not have their own calendar.
CourseWork	Students have their own calendars. The instructor can place events and notifications into the online calendar of the course. The students can see their test results, and compare it with the group result. Every student has his (or her) own home page, containing the list of all the courses that he (or she) participates in.
WebCT 4.0 CE	The instructor and the students can write into online calendar. Students can see their own test results.
VirtualCR	Students can see their own test results.

Help	
Cleroline	The system has its own guide for teachers and for students. It can be downloaded. No online help is available.
CourseWork	System has a guide, online help and a collection of frequently asked questions (FAQ)
WebCT 4.0 CE	The system has online help and a basic training course.
VirtualCR	NA

Searching in the course	
Cleroline	None
CourseWork	None
WebCT 4.0 CE	Students can search in lectures, e-mails, and notifications at forum and in the comments.
VirtualCR	NA

Offline mode and synchronization	
Cleroline	None
CourseWork	None
WebCT 4.0 CE	Students can download the curricula in normal or in printer friendly format.
VirtualCR	Students can download the curricula.

3.3 "Joining the Group" and Tools for Animating

Group's work	
Cleroline	The instructor is the one who forms the groups. Every group can have its own forum and file exchange system which cannot be seen by the members of some other group.

CourseWork	None
WebCT 4.0 CE	The instructor or the system (randomly) forms the groups. The group has its own forum and shared folder.
VirtualCR	There are no different groups

Self-testing

Cleroline	The instructor is the one who can create a test to be used by the students. The system has the following questioning options: True/False questions, multiple choice with one correct answer, multiple choice with more than one correct answer. Some additional information created by the instructor can be presented.
CourseWork	The instructor can create the test, which will be used by the students. The test can be done more than once. System checks the answers and presents the result with or without some additional explanations and with links to the lectures in which the current problem is described in details.
WebCT 4.0 CE	The instructor can create the test, which will be used by the students. The system checks the answers and presents the result with or without some additional explanations from the instructor. The equation editor can be used to write some mathematical formulas.
VirtualCR	The system creates different tests for every student randomly. Questioning options: multiple choice test with one correct answer.

Community

Cleroline	None
CourseWork	None
WebCT 4.0 CE	Students can create online clubs or groups.
VirtualCR	None

Student's portfolio

Cleroline	Every student has their public folder, which is used to present the finished projects.
CourseWork	None
WebCT 4.0 CE	Students can create their own home page.
VirtualCR	None

3.4 Administration Tools

Authentication

Cleroline	The instructor can set the course to be private or public. The private courses can be accessed only with a valid username and password. The system offers option for saving

	password, and securing the sessions with MD5 encryption algorithm.
CourseWork	The instructor can set the course to be private or public. The private courses can be accessed only with a valid username and password. The authentication is done with Cerberus protocol. The system offers option for saving and changing the password.
WebCT 4.0 CE	The instructor can set the course to be private or public. The private courses can be accessed only with a valid username and password. Access restriction also can be done by the user's IP address. The authentication can be secured with SSL algorithm. The system offers option for saving the password and to use the Cerberus protocol.
VirtualCR	The courses can be accessed only with a valid username and password. The system offers the MD5 encryption algorithm for the data security.

Levels of authentication	
Cleroline	User and administrator.
CourseWork	The system administrator can create different access privileges for different groups, for example: instructor, student, assistant, guest, administrator etc.
WebCT 4.0 CE	Same as Coursework's
VirtualCR	User and administrator.

3.5 Presentation Tools and Lectures Distribution

Self-testing	
Cleroline	Types of questions: multiple choice with one correct answer, more the one correct answer; comparison, fill-in. The question may contain pictures. The instructor can make the test or it can be created with random method by the system. The system corrects the test automatically.
CourseWork	The same as Cleroline. The differences are: the question can contain video and sound files, and the instructor can set the date and time when the test can be accessed.
WebCT 4.0 CE	The same as the first two, plus the following difference: the question also can be a True/False and a short assay type. The instructor can set the test's duration time, and can use the IP address to restrict or allow access. Using the Mathematics Markup Language equation editor the test can contain mathematical symbols.
VirtualCR	Types of questions: multiple choice - one answer correct. The test is created randomly by the system. The system

	corrects the test automatically. The questions can contain only plain text.

Student's watch	
Cleroline	The instructor can have a report of how many users have accessed the lectures
CourseWork	None
WebCT 4.0 CE	In the report the instructor can see for each student when the test was accessed, how many times he had tried to pass, which lecture was accessed etc. The report also contains the student's activity time on the curriculum and on the forum.
VirtualCR	In the report, the instructor can see for every student when he tried the exam, and the result of the test.

3.6 Software Requirements

Software requirements	
Cleroline	Every browser is supported.
CourseWork	Internet Explorer (IE) 5.x and Netscape(NS) 4.7+
WebCT 4.0 CE	IE 5.1+, NS 4,76+, AOL 7.0+, running Java Scripts are required
VirtualCR	Every browser is supported.

Database	
Cleroline	MySQL
CourseWork	Oracle 8+, PostGreSQL
WebCT 4.0 CE	NA
VirtualCR	MySQL

Server software	
Cleroline	PHP 4.x, MySQL, Apache
CourseWork	Java Servelet engine (TomCat), Java-run environment, Apache, DTL (HTML templating language)
WebCT 4.0 CE	Perl 5.x Apache
VirtualCR	PHP 4.x, MySQL, Apache

Server OS	
Cleroline	System runs on every Unix
CourseWork	Sun Solaris 8
WebCT 4.0 CE	Red Hat Linux 7.3
VirtualCR	System runs on every Unix

Windows server	
Cleroline	System runs on IIS
CourseWork	NA

WebCT 4.0 CE	Windows 2000 Server SP3
VirtualCR	NA

3.7 Price

Price	
Cleroline	Open source, www.icampus.ucl.ac.be/CLARO01/
CourseWork	Open Source
WebCT 4.0 CE	Must pay a license (3000 students)
VirtualCR	Open Source

Versions	
Cleroline	1.6
CourseWork	3.2
WebCT 4.0 CE	4.0
VirtualCR	1.0

4 Summary

One of the most important factors in student's learning process and motivation is communication. The participants in a learning process cannot be isolated. WebCT platform has the greatest number of communication tools. WebCT has options for asynchronous and synchronous communication. The CourseWork from the communication supports only e-mail and file sharing. None of the systems support a video service.

The WebCT also has the most precise and richest supplements. It is only this system that has on-line help and short lectures about using the WebCT for instructors and students. In this system we can perform the most complete search. It has the most number of roles, the best security settings and the easiest administration.

Such a versatile offer of options and services is connected with the fact that WebCT is not open source product like Claroline and CourseWork. Its license and support price is not economical unless the number of students is less than 10000.

None of the four systems support the SCORM standard, and they do not follow the actual standard for e-learning platforms (IEEE P1484.1 LTSA – Draft Standard for Learning Technology – Learning Technology System Architecture).

Conclusion

The society in which we live can be described as "information-oriented". In such a surroundings there is a growing need for constant learning. As our circumstances

of living are changing, the same can be said about learning and teaching. The e-learning platforms represent the new teaching and learning models. At the end of 1990s only few e-learning platforms existed and they were rather non-attractive for most of the users. With the development of web technologies, today we have plenty of different e-learning systems. As an answer to this onslaught, certain standards were established in this field of education and computer science. These standards are meant to set the criteria for rating e-learning platforms, and to make comparison easier.

This work used the comparison criteria recommended by the EduTools community. With these criteria as a conclusion, we can say that the most complete and best quality e-learning platform is WebCT.

References

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