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A PRAGMATIC ANALYSIS ON ASSORTED TECHNOLOGY DRIVEN E-LEARNING PRODUCTS IN EDUCATION

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ABSTRACT

In last few years, technology motivated items have obtained lots of popularity in the universities throughout the planet to improve the quality as well as model of traditional education and learning system. Many academic businesses are using Learning Management Systems (LMS) to increase the asynchronous learning with the development of exclusive classes and mobile learning surroundings. Moreover, the focus is set to motivate the idea of anytime-anywhere existence of guides to the students. LMS Goods are now commonly used to control clients' courseware,



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monitoring their success as well as across all types of exercising actions. A number of segments are included within these items to provide and handle instructor-led synchronous and asynchronous online exercising depending on learning item technique. Such web-based software services allow staff to create and handle course content, as well as share and view college student efforts. This paper features the use of free technology to increase up the academic actions for fast travel education and learning and provides a scientific research performed using a major free solution, Moodle.

Keywords: Asynchronous Learning, E-Learning, Open Source Technology, Virtual Learning Environment, Learning Management Systems, Performance Evaluation

INTRODUCTION

Colleges and other college organizations are gradually switching to VLE (Virtual Learning Environment) items to save the time of trainers, especially when they are also involved in research and management. The conventional "Chalk and Talk" training is being changed by the specific application items. Moreover, trainers are not required to have experience in web growth to work on such application. With the use of VLEs, professional education and learning can be put on fast travel and reliable and genuine results can be acquired with review creation service depending on different factors.

The idea of Exclusive or simply Internet-Based Studying is not new to the world. The academic organizations are using the features of Exclusive Studying Surroundings from



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Sixties when first learning management program was developed called PLATO (Programmed Logic for Automated Teaching Operations) at the School of Celui-ci at Urbana-Champaign. PLATO is now possessed by PLATO Studying, which provides handled course content over the Online. The PLATO program presented several tasks, learners, who could study allocated training and connect with trainers through on-line notices, trainers, who could analyze university student success data, as well as connect and take training themselves, and writers, who could do all of the above, plus create new training. [1]

E-LEARNING PRODUCTS AND GLOBAL MARKET

The current industry of e-learning is growing at very fast speed throughout the world. As per reports, LMS Industry represented an \$860 million market, made up of more than 60 different providers in year 2009. The LMS product companies constitute approximately 43% of the market [2]. LMS products are available in the software market in two flavors including licensed version and open source. Now, the open source software has become the choice of academia because of its \$0.00 acquisition cost. Additionally, it can be easily customized and integrated with other systems, including proprietary ones.

In year 2008, the business of open-source industry was worth \$60 billion, not because of its vendors' collective revenue, but because of the value of the cost savings for customers, as per statistics given by John Powell, CEO of Alfresco, one of the leading LMS Developer and Consultancy Organization [3]. The interest in the open source



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products has increased because of the flexibility in terms of development, enhancement and optimization of existing resources. These products are available on Internet and distributable media with installers, binaries and entire source code with business logic.

While the installers and binaries are used to deploy and use the application directly, the source code can be accessed and modified for further enhancement of software. Most of the well-known open source LMS products are written in PHP because of security and flexibility provided in the frameworks like Joomla, Drupal, Typo3, Wordpress, XOOP and many more. Moreover, the platform independence and excellent query execution speed is another factor which makes PHP most obvious choice for open source technologies.

The counting of open source LMS available in the market is increasing day by day as many software tycoons are turning to this stream to deliver e-learning software services to global market. Out of countless LMS products, some of the popular commercial systems available are: WebBoard, WebCT, and Blackboard; on the open source platform are: Moodle, and Sakai [4]. But these days, many open source LMSs are competing to show their presence in the international market which includes Dokeos, ILIAS, dotLRN, Open LMS, Caroline, aTutor and OLAT.

Despite number of products available, some LMSs have achieved recognition very soon. Moodle is one of the excellent examples. Moodle serves in 80 international languages and is currently having 32 million users from 209 countries [5]. As there are no license fees or limits to growth, an institution can add as many Moodle servers as



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needed. The Open University, UK is the second largest Moodle deployment by user-base, with 607,536 users and 4,731 courses [5].

ILIAS is another prominent open source web-based learning management system which supports learning content management (SCORM compliant) and tools for collaboration, communication, evaluation and assessment. Sharable Content Object Reference Model (SCORM) is the collection of standards and specifications for web-based e-learning to define communications between client side content and a host system, called the run-time environment. It is a function of an LMS. SCORM also defines the way in which contents may be packaged into a transferable ZIP file. SCORM standard uses XML, which is based on the results of work done by AICC, IMS Global, IEEE, and Ariadne.

These products possess unique features to be incorporated in the educational institutions as Institute Management System. There are some limitations associated with every product including concurrent processing, software and hardware requirements, maximum number of enrolment in courses etc. A significant research and development work is going on in this field to improve the services in these products. The issues associated with the LMS can be resolved with the customization of open source product according to the requirements as well as to improve the efficiency of the system.

As accessibility and efficiency have become the prime parameters deciding the functionality of the platform; they are also primordial element of evaluating and selecting



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for a suitable E-learning management platform. There are lots of features in the open-source E-learning management platforms which are based on different environment construction, and have different application's localization in the education.

COMPARISON BETWEEN SAKAI AND MOODLE

Parameter	Moodle	Sakai	Graph
Community Website Traffic	150 per million	20 per million	<p>Website Traffic (Alexa visitors per million)</p>



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<p>Business Readiness Rating</p>	<p>4.19</p>	<p>3.23</p>	<table border="1"> <caption>Business Readiness Data</caption> <thead> <tr> <th>Platform</th> <th>Rating</th> </tr> </thead> <tbody> <tr> <td>Moodle</td> <td>4.19</td> </tr> <tr> <td>Sakai</td> <td>3.23</td> </tr> </tbody> </table>	Platform	Rating	Moodle	4.19	Sakai	3.23
Platform	Rating								
Moodle	4.19								
Sakai	3.23								
<p>Vendors</p>	<p>27</p>	<p>11</p>	<table border="1"> <caption>Vendors Data</caption> <thead> <tr> <th>Platform</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>Moodle</td> <td>27</td> </tr> <tr> <td>Sakai</td> <td>11</td> </tr> </tbody> </table>	Platform	Count	Moodle	27	Sakai	11
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<p>Install base</p>	<p>8900</p>	<p>35</p>	<table border="1"> <caption>Install Base Data</caption> <thead> <tr> <th>Platform</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Moodle</td> <td>8900</td> </tr> <tr> <td>Sakai</td> <td>35</td> </tr> </tbody> </table>	Platform	Value	Moodle	8900	Sakai	35
Platform	Value								
Moodle	8900								
Sakai	35								
<p>Funding</p>	<p>\$0 initial funding and ~ \$12,000 a year from individual donors</p>	<p>\$2,200,000 initial grant from Mellon Foundation and Hewlett Foundation and \$4,400,000 from core part</p>	<table border="1"> <caption>Funding Data</caption> <thead> <tr> <th>Platform</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Moodle</td> <td>\$0</td> </tr> <tr> <td>Sakai</td> <td>\$6,600,000</td> </tr> </tbody> </table>	Platform	Value	Moodle	\$0	Sakai	\$6,600,000
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		ners	
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Source: <http://www.zacker.org/sakai-project-vs-moodle>

OTHER COMPARISONS BETWEEN MOODLE AND SAKAI

Parameter	MOODLE	Sakai
Founded in year	2002	2004
Architecture Language	LAMP (PHP)	J2EE (Java)
Developers	Dr. Martin Dougiamas Australia	University of Michigan, Stanford University, Indiana University
Official website	www.moodle.org	www.sakaiproject.org

Merits and shortcomings of Moodle

Major Merits

- Supports 75 international languages.
- Very effective students' activities monitoring system.



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- Efficient exchange of information using chat forums.
- Excellent support to audio and video formats.
- Large community of programmers and users to share the resources and troubleshooting and building procedures.
- Availability of large number of modules to implement e-Learning in academic institutions.
- Efficient handling of concurrency issues in the latest version of Moodle. 50 users can access the system without any special system requirements.

Major Shortcomings

- Separate Login is required to visit a different course.
- Curriculum resources are sufficient but not rich.
- Filename of link must be in English, causing inconvenience for users in other languages.

Merits and shortcomings of Sakai

Major merits

- Large Community of users to share support and communicate effectively.
- Powerful platform for teaching-learning processes.

Major Shortcomings



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- Complex system architecture. It needs specialists to troubleshoot and maintain the platform.
- User Interface of the system is not user friendly and hard to operate.
- Customization is difficult and time consuming.

COMPARISON BETWEEN ANGLE, BBLEARN AND MOODLE LEARNING MANAGEMENT SYSTEMS

Parameter	Angel 7.3	BBLearn 9.0	Moodle 1.9
Browser support	IE 6 and IE7, Firefox, Safari and Chrome	IE 6 and IE7, Safari and Chrome	IE 6 and IE7, Firefox, Safari and Chrome. Depending on the uploaded theme (CSS file) some features might not function properly in some browsers. But that's a CSS issue.
Number of "Home Pages"	Two - a system home page (after login) and	There are 3 home pages: System home page (after	System home page (after login) ; course home page



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	a course home page. Fewer areas to confuse the user.	login), institution's home page, list of courses home page and course home page.	
Communications tools	Standard communication tools - mail messages and chat. Include also discussion boards, and office hours as chat.	Standard communication tools - mail messages and chat. Include also discussion boards, and office hours as chat.	Standard communication tools - mail messages and chat. Include also discussion boards.
Mobile support	User can activate PDA mode reading from home page	BB developed a free software for iPhone and iTouch access to BBLearn 9.	Some users claim to be able accessing Moodle through some Smart Phones or PDAs. It's not an official feature though
Calendar	Directly editable - user can click	Not directly editable. Faculty/editor can	Not directly editable. Editors may add a new



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	on a given date in the calendar and edit an event.	create only a personal event.	event by opening a specific calendar month and press a "New Event" button.
Reports	Per achievement (content, learning outcome, grades etc), per activity, per user, per date	Per group, per forum,	Per course, per group, per user, per date, per activity / Shows log reports on two main area: performed actions and participation within LMS
Third parties Integration	ePortfolio	Wimba Classroom	Google
Course home pages	Trial version comes originally with login activity, grades, mail, course announcements everything is customizable.	Trial version comes with: Areas [in tabs] such as Alerts, my calendar, to do list. Resource blocks: course catalog, course list, course search, hot	Course home page = customizable but you can have from just 2 blocks (Messages and course outline) up to 20 blocks. Customization is accessible from the same page through Edit Mode



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		links, hot spots	switch.
Usability	GUI is pleasant, font type is readable, clean , system colors are agreeable to the eye; "L" shape menu composed by left iconic bar and horizontal top tabs menu - tabs are worded with nouns and verbs that communicate clear functionality; iconic menu is not worded which	GUI is polluted and busy with too many resource blocks/menus. The "L" shape menu composed by a horizontal top tab menu and a worded menu on the left side confuses the users with the other menu on top of the page. The color palette is pleasant to the eye. Font type is good and readable. Breadcrumbs are fairly comprehensive. The content areas in the	GUI offers a great deal of Customization through upload of CSSs. The original Moodle theme is not very appealing but Moodle Themes are freely and easily downloadable from moodle.org where user can upload any tailored CSS.



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	may confuse the user to distinguish top and left menu	LMS are generally visible and well divided. It is clear where a menu goes and where content goes.	
Web2.0	Blog, Wiki, Forums, AJAX enabled interface - users can drag resource block within the menu	Blog, Forums, Ajax-enabled interface editors or faculty may drag resource blocks to rearrange menus.	Ajax-enabled for menu content. It's not drag and drop but, depending on the selected theme/skin user can move blocks/menu of position inside the home page. The resource blocks edited by a teacher or a course editor will show only for a specific course. Modifications done by Administrator, however, can be selected to be shown in all courses which are referred as to



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			system editing.
Services & Support	<p>Angel offers third party support and institution gets depending on the price paid. .It's divided in Tier 1, Tier 2, and Tier 3. They also have a online documentation as well as training, and consulting (also paid but not included in the original price). Documentation includes installation,</p>	<p>Blackboard offers 24/7 support included in the application's pricing. It's also divided in Tier 1, Tier 2, and Tier 3.</p>	<p>Moodle Rooms offers support under a Maintenance package contract. Moodle.org has an extensive "Community" forum where you can find or post any questions users have. Http://docs.moodle.org contains all necessary documentation for Moodle's use.</p>



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	programmer's manual, and end user guide (not public)		
Themes / Skin	User can select from a library of themes (which is basically different set of colors and an image); user may edit a theme while logged in but only a small set of fonts are available (not trebuchet), color scheme (background, highlights, menu	Customize Menu colors and display, change banner image, content starting point	Free library of Moodle Themes available at Moodle.org administrators can download zip files from. Then they can upload several at once to the system. When Choose a new theme that has been uploaded you can preview your own content with that new theme.



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	bars and some other small details) and icons sets and styles are also available from a library		
Content organization / navigability	Expandable Lesson tree ("Map") on the left side helps student to find themselves within the course's linearity; Content area is large and provides a better reading area to students; it provides	Course outline utilizes icons that are too large. Faculty/editor can select content window to be displayed in full window. But content window it doesn't provide navigation buttons to enable content navigability.	It depends on the Moodle Theme being used. Some themes are very clean and usable. They present course outlines in an organized fashion.



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	Navigability with "Previous" and "Next" links without having to go back to the menu		
Learning Repository	Allow editor/faculty to easily work on content without having to publish it first and run the risk of students viewing it. When editing work is done inside the LMS user can choose to either link or import entire content to a specific course	Contains a file manager resource. It also provides the user a "Content" area in which the user can work on "My Content", "Course Content", "Institutional Content", "Library Content", "Portfolio" - too many options.	User can easily and directly ads, edit, indent items in the course outline. Also, a File Manager can be used as a learning repository to upload all contents at once and linking them to a course later.



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	- this publishing option. This can also be difficult when you'd like to publish a new material directly into the course.		
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COMPARISON BETWEEN ATUTOR, CLAROLINE AND DOKEOS

Parameter	ATutor	Claroline	Dokeos
Architecture Language	LAMP (PHP)	LAMP (PHP)	LAMP (PHP)
Developers	Adaptive Technology Resource Centre, University of Toronto	University of Leuven, Belgium	Belgium based Community
Official website	www.atutor.ca	www.claroline.net	www.dokeos.net



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Merits and shortcomings of ATutor

Major merits

- User friendly for faculty as well as students.
- Very efficient search and explore functions.
- Resources can be downloaded in bulk as compressed zip format.
- Excellent support for various audio and video formats.

Major Shortcomings

- Many international languages are not supported.
- Very few modules are available for additional features and applications.

Merits and shortcomings Claroline

Major merits

- User friendly in terms of creating and managing the courses and there is no need of technical expertise to operate the system [7].
- Auto Troubleshooting is enabled by default, so that, abnormal operations can be scanned out immediately.

Major Shortcomings



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- Chat and Forum are too simple and are in very basic format. Users may not be willing to use it.
- Interaction for faculty is good but the same is not very effective for students.

Merits and Shortcomings Dokeos

Major Advantages

- Exceptional support for multimedia applications.
- Availability of online Real-time learning [8], such as teaching through audio-video conferencing.
- Online tests and quiz modules are very effective and have variety of tests.
- Excellent tools to get statistics of students' activities.

Major Shortcomings

- Multilingual Support is missing.
- Tools and Modules for students are not sufficient.

From long time, there is the need to set up an online platform for educators by free open sourced educational systems including Wiki, Blog, Bulletin Board, Content/Course Management System (XOOPS and Moodle), and MOO (MUD, Object Oriented) [9]. A



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number of e-learning platforms are available in the e-learning industry, but the academic establishments are concentrating on open source technologies due to flexibility and efficiency of the products.

On the basis of market analysis and performance of major LMSs, the online assessment tests were conducted for all engineering streams on Moodle with the in-built application - Quiz module. The Quiz Activity Module in Moodle LMS is capable to design and set quizzes consisting of a large variety of question types, including multiple choices, true-false, and short answer questions. The questions are kept in the Question bank and can be re-used in multiple tests. The quiz module can display feedback and scores at different times during the quiz, using the review options.

The quiz module has a large number of options and tools to conduct the examination efficiently. To display random questions from a set of question bank is one of the excellent features in Moodle. Quizzes with different question types can be randomly generated from different categories of questions. In addition, there is lot of flexibility in conducting the online tests in Moodle. The Test candidates can be allowed repeated attempts at a question or can also be allowed to retake a quiz multiple times.

Moreover, different presentation methods make the same quiz appear different each time. It can be implemented by customizing the printed format (By Setting the Page Breaks) or by setting the number of questions per page and the questions can be shuffled in regards to presentation order, as well.



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SCOPE OF FUTURE WORK

Open-source E-learning Management Systems are getting a different counter in market and the product development as well as customization is going on at a fast pace. Moreover, the organizations are actively probing into the scope and further enhancement to promote the culture of e-learning with ease and efficiency. A renowned academician, Dr. J. D. Bransford, divides the virtual community of network teaching in three models -knowledge-centric, evaluation-centric and student-centric.

Every model has unique features and characteristics. The present e-learning systems support only knowledge-centric learning [11] and lacking in evaluation-centric and student-centric. Most of existing open source e-learning management platforms support knowledge-centric, as in the traditional classroom set up. The e-learning management platforms must care more of teaching using evaluation-centric and student-centric models. There is still much to explore in the other two models.

In the present system, a teacher's role cannot be personalized as the teaching activity carries on with the aid of network; there is still an expanse between teacher and student in the space and time. It is difficult to carry on exchanging the content with emotions and individual policies; meanwhile it is difficult for the instructor to control student's learning activity. Here is a lot of scope for the developers of open-source e-Learning management platforms to spend more of efforts on this area to enhance the effect of network study.



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CONCLUSION

The e-learning market is certainly moving in upwards direction for the advancement of higher education model and the software moguls are making open-source e-Learning management platforms more efficient and user friendly. The open-source e-learning management platforms are on the front foot in the education industry to play a long inning with great score in the market. An important academic activity, online examination, was conducted on Moodle and the performance establishes the fact that such Open Source LMSs are boon to the academia. As there are no license fees or limits to growth, an academic institution can add as many such LMS Servers as needed. The development and customization of the open-source platforms is a continually growing process, and in the near future, it will bring us more surprises.

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