

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/232615507>

# Why Moodle

Article · October 2008

DOI: 10.1109/FTDCS.2008.22

---

CITATIONS

91

---

READS

9,086

2 authors:



A. Al-Ajlan

Qassim University

20 PUBLICATIONS 340 CITATIONS

SEE PROFILE



Hussein Zedan

De Montfort University

168 PUBLICATIONS 2,079 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Interactive multimedia e-learning for effective learning [View project](#)

## Why Moodle

Ajlan Al-Ajlan  
Software Technology Research  
Laboratory (STRL)  
De Montfort University  
The Gateway, Leicester, LE1 9BH, UK.  
ajlan2003@yahoo.com

Hussein Zedan  
Software Technology Research  
Laboratory (STRL)  
De Montfort University  
The Gateway, Leicester, LE1 9BH, UK.  
hzedan@dmu.ac.uk

### Abstract

*Using the Internet to enhance e-learning has become a trend in modern higher education institutes. E-learning systems are increasingly becoming an important part of the strategy for delivering online and flexible e-learning. The main advantage of e-learning is the opportunity for students to interact electronically with each other and their teachers during forums, on discussion boards, by e-mail and in chat rooms. Though recognizing that the world at large will continue to use terminology in different and often ambiguous ways, the term of Virtual Learning Environments (VLE) is used to refer to the on-line interactions of a variety of kinds that take place between learners and instructors. There are many pieces of software available that provide VLE systems, both commercial and Open Source Software (OSS). One such system that has been gradually gaining worldwide popularity is known as Moodle. This paper focuses on this platform and on a comparison between VLE (Moodle) and other VLE systems in order to discover their strengths and limitations. The comparative study is in two phases. The first phase is based on the features and capabilities of VLE tools and the second phase is based on the technical aspects of the VLE platforms.*

### Keywords

E-learning, Virtual Learning Environment, Open Source Software, Moodle.

### 1. Introduction

Together with the rapidly increasing popularity of the Internet in recent years, there is an increasing demand for methodologies and technologies for e-learning. E-learning is an interactive learning in which the learning content is available on-line and provides automatic feedback to the student's learning activities

[1]. Therefore, there has been an increasing demand for VLE methodologies and technologies. VLE is defined as interactive learning in which the learning content is available on-line and provides automatic feedback to the student's learning activities. While recognizing that the world at large will continue to use terminology in different and often ambiguous ways, the term of VLE is used here to refer to on-line interactions of various kinds including on-line learning that takes place between learners and instructors [2-4].

Currently, there are already more than 250 providers of commercial e-learning and more than 45 of them are Open Source Software (OSS) offerings as free VLE systems. Of the better-known OSS are Moodle, Ilias, eduplone, Claroline, SAKAI, WebCT and Bscw, and they have wide developer communities who present robust arguments for considering OSS as a straightforward and potentially feasible competitor to commercial products. One OSS project that has emerged to meet the growing interest in OSS is Modular Object-Oriented Dynamic Learning Environment (Moodle) [6, 7].

Moodle is a web-based Learning Content Management System (LCMS), i.e. a Course Management System (CMS) and VLE designed around pedagogical principles, namely a social constructivist philosophy using the collaborative possibilities of the Internet [8]. It allows teachers to provide and share documents, graded assignments, quizzes, etc. with students in an easy-to-learn way, and to create quality on-line courses. Moodle is a free OSS, which means users are free to download, use, modify and even to distribute it under the terms of GNU [5, 9].

An important resource for higher education, especially universities, is VLE, which has been enhancing students' progress with high quality learning around the world. In 2004, Qassim University was established in the district of Qassim in Saudi Arabia. It has 15 colleges, around 900 teachers, and more than 17000 students. This paper will propose a suitable e-learning system for Qassim University through a

comparative study of the most well-known e-learning systems.

This paper is structured as follows. A literature review of VLE is presented in Section 2, containing the reasons for choosing Moodle together with its limitations. The significant section is the comparative study between Moodle and other VLE systems, which is described in Section 3. A brief discussion on the findings of this paper is described in Section 4. Finally, the conclusion and future work are described in Section 5.

## 2. Moodle as E-learning System

Currently, there is an increasing demand for on-line learning methodologies and technologies, especially for e-learning. E-learning is a group effort, where educators, designers, administrators, and users from other areas of expertise come together in order to serve a community of learners [10, 11]. VLE is a form of e-learning that enables on-line interactions of various kinds to take place between teachers and students. VLE offers for institutes a number of benefits, such as access anytime and anywhere, better integration of application technology tools, opportunities for independent learning, improved motivation, and access to novel learning styles. In order for current and future generations of personalized VLE to improve learning efficiency and effectiveness, there are essential requirements that have to be realized [6, 12].

Moodle enables teachers to provide graded assignments, lessons, and choice, to share documents, quizzes, workshops, and chat, and to offer a forum for learners, in a manner that is both easy and offers high quality learning. Moodle is one of the most user-friendly and flexible of the globally-free open source courseware products available, and is specifically designed to help educators who want to create high quality on-line courses [5, 13, 14]. It has excellent documentation, strong support for security and administration, and is evolving towards Information Management System/Shareable Content Object Reference Model (IMS/SCORM) standards [6, 8, 9].

Moodle, as an e-learning system, has been developed by a long list of specialists who have contributed to the development of its many stages. It contains all development information as well as a roadmap, a coding guide, and a commonly-used way of managing source codes for large software projects when accessing source codes. Moodle is available in a variety of download packages with different levels of constancy from <http://download.moodle.org> [5, 15].

Moodle as a VLE has an important feature which is the Moodle.org web site, which provides a central

point for information and collaboration among Moodle users, who include system administrators, instructional designers and of course, developers. This site is always evolving to suit the needs of the community. Moodle is now used not only in universities, but also in high and primary schools, non-profit organizations and private companies, by independent teachers and even home-schooling parents. A growing number of people from around the world are contributing to Moodle in different ways [2, 5, 16].

Moodle is based on Social Constructionist Pedagogy, which is a learner-oriented philosophy and most VLE modules are based on it. They are largely concerned with how course contents are delivered to students who are involved in constructing their own learning package [14, 17]. The learner-oriented philosophy to learning is where learners actively construct new knowledge through personalized modification by adopting a more subjective stance to the knowledge being created, and they learn even more by explaining what they have learnt to others. These ideas run parallel to the way open-source development works, in which the developers are also often users, where everyone is free to tinker with the software, and where codes are constructed, peer-reviewed and refined by means of open discussion [6, 18].

### 2.1. The Reasons for Choosing Moodle

The importance of Moodle is that it rates well according to many reports, has a high grade of acceptance in the community and in a number of institutions, and has a wide variety of active courses, available in many languages [14, 15]. It gives users the ability to post news items, assignments, electronic journals and resources, and to collect assignments etc. The greatest strength of Moodle is that the community has grown around the project; both developers and users participate in Moodle's active discussion forums, sharing tips, posting code snippets, helping new users, sharing resources and debating new ideas [8, 18, 19].

Therefore, we have chosen the software of Moodle to be our field of research and analysis. It is important to understand the Moodle environment, and to explore its functionalities and limitations in order to develop practical examples for the use of VLE in Qassim University. We list here the most important reasons for choosing Moodle:

1. It is an OSS, which means users are free to download it, use it, modify it and even distribute it under the terms of the GNU license [2, 5, 8, 18, 20];
2. It is a CMS & VLE that lets teachers provide and share documents, graded assignments, discussion

forums, etc. with their students in an easy-to-learn fashion, and in high quality on-line courses [5, 6];

3. Moodle can be used on almost all servers that can use PHP. Users can download and use it on any computer and can easily upgrade it from one version to the next [16, 18, 19];
4. The key to Moodle is that is developed with both *pedagogy* and *technology* in mind. One of the main advantages of Moodle over other systems is its strong grounding in social constructionist pedagogy and good educational tools [21];
5. The Moodle software is used all over the world by independent teachers, schools, universities and companies. The credibility of Moodle is very high. Currently, there are 3324 web sites from 175 countries that have registered with it, and it has 75 languages [5, 6, 18];
6. Moodle runs without modification on any system that supports PHP such as Unix, Linux and Windows. It uses MySQL, PostgreSQL and Oracle databases, and others are also supported [20].
7. It has many features useful to potential students such as easy installation, customization of options and settings, good support/help, and good educational tools. Moreover, it has excellent documentation, and strong support for security and administration [21].

## 2.2. The Limitations of Moodle

Moodle's low cost, flexibility and ease of use helps bring VLE technology within the reach of those with limited technical or financial resources [15]. On the other hand, Moodle has some limitations as follows:

1. Moodle is only for IT experts. It is complex for normal users to use and more than 66% of them are teachers, researchers and administrators [18];
2. It is difficult for beginner technicians to install and use Moodle, because there are many technical word lists in installation instructions [15];
3. Moodle will work, but not by itself. If there is not a course administrator that can work with both teachers and technicians in creating on-line materials, then Moodle will remain an empty shell, like a good aircraft but with no pilot;
4. Lack of simple-to-obtain support. Forums carry a great deal of information, but nearly all forums are in the English language [18];

## 3. Comparative Study between Moodle and other VLE Platforms

This paper proposes a comparative study between Moodle and other VLE systems that will aid Qassim University in determining the best system to meet its needs. It is important to make this comparative study between Moodle and other VLE products in order to explore their strengths and limitations. This comparative study is conducted in two phases. The first phase is based on the features and capabilities of VLE tools, and the second study is based on the technical aspects of VLE systems.

### 3.1. Comparative Study Based on Features and Capabilities of VLE Tools

VLEs have many features and capabilities expected from e-learning counting forums, content management, quizzes with different kinds of questions, and a number of activity modules [8]. Table 1 below shows the VLE products that have been selected in this study, which are 10 products including Moodle. The comparison is based on the features and capabilities of their VLE tools. There is no single product that can meet all of these criteria and the ideal may not be obtainable for interface, technical, functional, or cost reasons [5, 22].

The comparison focuses on two kinds of products. The first is commercial e-learning systems, and includes Desire2Learn 8.1, KEWL, Blackboard Learning System (V.7), ANGEL Learning Management Suite (7.1) and eCollege. The second is OSS and includes Moodle 1.8, Claroline 1.6, Dokeos 2.1.1, OLAT and Sakai 2.3.1. The comparison has two answers, Y or N; Y means the product has the feature and N means the product does not.

VLEs, as e-learning systems, have many features and capabilities but in order to simplify and clarify the comparison, we have divided these features and capabilities into three phases, which are Learner Tools, Support Tools and Technical Tools, as in Tables 1, 2 and 3. Also, this comparison has two kinds of answers Yes (Y) or No (N). In this session, we will focus on each phase separately as follows:

**3.1.1. Learner Tools.** These tools contain three kinds of tools, which are Communication Tools, Productivity Tools and Student Involvement Tools. Each kind of Learner Tool contains various features and capabilities, and each product has some of them, as in Table 1.

**Table 1: The Comparison between the Selected VLE Products based on Learner Tools.**

No	1	2	3	4	5	6	7	8	9	10
<b>Product Name</b>	Desire2Learn 8.1	KEWL	ANGEL Learning Management Suite (7.1)	eCollege	The Blackboard Learning System	Moodle 1.8	Claroline 1.6	Dokeos 2.1.1	OLAT	Sakai 2.3.1
<b>Tools</b>										
<b>1. Learner Tools</b>										
<b>1.1. Communication Tools</b>										
Discussion Forums	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Discussion Management	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
File Exchange	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Internal Email	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
On-line Journal	Y	Y	N	Y	N	Y	N	Y	Y	Y
Real-time Chat	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Video Services	N	N	N	N	N	Y	N	N	N	N
Whiteboard	Y	N	Y	Y	Y	Y	N	N	Y	Y
<b>1.2. Productivity Tools</b>										
Bookmarks	Y	Y	Y	Y	N	N	Y	N	N	Y
Calendar	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Orientation	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Searching Course	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Work Off-line	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
<b>1.3. Student Involvement Tools</b>										
Group work	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Community	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Student Portfolios	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
<b>Total Features</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Total Available</b>	<b>15</b>	<b>14</b>	<b>15</b>	<b>14</b>	<b>14</b>	<b>15</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>15</b>
<b>Total Missing</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>1</b>

As we can see in Table 1, the comparison between the VLE products is based on Learner Tools. Four products are shown to be the best with almost the maximum number of features - 15 out of 16 features or capabilities of Learner Tools. These products are Moodle, Desire2Learn, ANGEL Learning Management Suite, and Sakai. The Claroline 1.6 product has the minimum features and capabilities of Learner Tools, missing 5 out of 16 features and capabilities. KEWL, eCollege and The Blackboard Learning System platforms have missed 2 out of 16. Moodle is the best with three products missing only one feature. Overall the best OSSs are Moodle and Sakai respectively, which missed 1 out of 16 Learner Tools.

**3.1.2. Support Tools.** These phases contain three kinds of tools, which are Administration Tools, Course Delivery Tools, and Content Development

Tools; all kinds of Support Tools have features and capabilities, as in Table 3.

**Table 2: The Comparison between the Selected VLE Products based on Support Tools.**

<b>2. Support Tools</b>										
<b>2.1. Administration Tools</b>										
Authentication	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Authorization	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
File Exchange	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Registration Integration	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<b>2.2. Course Delivery Tools</b>										
Test Types	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Automated Management	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Automated Support	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Course Management	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
On-line Grading	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Student Tracking	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
<b>2.3. Content Development Tools</b>										
Accessibility	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
Content Sharing	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Course Templates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Look and Feel	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Design	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Instructional Standards	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<b>Total Features</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Total available</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>15</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>16</b>	<b>16</b>
<b>Total Missing</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>

As we can see in Table 2, the comparison between the VLE products is based on Support Tools. In this phase, all products have all features and capabilities except eCollege, Dokeos 2.1.1 and The Blackboard Learning System (V.7). This means that Moodle and the other remaining products are strong on Support Tools.

**3.1.3. Technical Specifications Tools.** These tools contain two kinds of tools, which are Hardware/Software tools and Pricing/Licensing; all kinds of Support Tools have some features and capabilities, as in Table 3. The Costs feature is different from other features because if the product has no cost, it means that product has an advantage and we will calculate it as Yes (Y). For example, in Table 3, Moodle has two N and we calculated N of cost as Y, so in the final score Moodle has missed just one feature.

**Table 3: The Comparison between the Selected VLE Systems based on Technical Specifications Tools.**

3. Technical Specifications										
3.1. Hardware/Software Tools										
Client Required	Y	Y	Y	Y	Y	Y	N	Y	N	Y
Database Requirements	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Unix Server	N	N	N	N	Y	Y	Y	Y	Y	Y
Windows	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
3.2. Pricing/Licensing Tools										
Company Profile	Y	Y	Y	Y	Y	N	N	N	Y	N
Costs	N	N	N	N	N	Y	Y	Y	Y	Y
Open Source	N	N	N	N	N	Y	Y	N	Y	Y
Optional Extras	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
<b>Total Features</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>
<b>Total available</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>7</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>7</b>
<b>Total Missing</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>

As we can see in Table 3, the comparison is based on Technical Specifications Tools. In this phase, the best products are Moodle 1.8, Sakai 2.3.1 and OLAT, which have missed only 1 out of 8 Technical Specifications Tools, and then Desire2Learn 8.1, The Blackboard Learning System and Dokeos 2.1.1, which missed 2 out of 8. The weakest products are KEWL and Claroline 1.6, which missed 4 out of 8 Technical Specifications Tools.

**3.1.4. The Final Result of the Comparison between Ten VLE Products.** From Table 4, we can see the final result of the comparison between the ten VLE products. The best products are Moodle (1.8) and Sakai 2.3.1, which have missed just 2 out of 40 features, and the second products are Desire2Learn 8.1 and ANGEL Learning Management Suite (7.1) equally, which have missed 3 out of 40 features. KEWL, Blackboard Learning System and OLAT have a similar number, which each missed 5 out of 40 features. The weakest product is Claroline 1.6, which missed 8 out of 40 features.

**Table 4: The Final Result of the Comparison between the Ten VLE Products**

No	1	2	3	4	5	6	7	8	9	10
<b>Product Name</b>	Desire2Learn 8.1	KEWL	ANGEL Learning Management Suite (7.1)	eCollege	The Blackboard Learning System	Moodle 1.8	Claroline 1.6	Dokeos 2.1.1	OLAT	Sakai 2.3.1
<b>Tools</b>										
<b>Total Features</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>
<b>Total Available</b>	<b>37</b>	<b>35</b>	<b>37</b>	<b>33</b>	<b>35</b>	<b>38</b>	<b>32</b>	<b>33</b>	<b>35</b>	<b>38</b>
<b>Total Missing</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>8</b>	<b>7</b>	<b>5</b>	<b>2</b>

### 3.2 Comparative Study Based on the Technical Aspects of the VLE Platforms

In this session, the comparison between the systems is based on technical categories. All VLE systems will be compared with the Moodle system as part of our study. As in our literature review, we have selected three studies focusing on this kind of comparison.

**3.2.1. First Study.** This study depends on some of the technical aspects of e-learning, as in Table 5. It displays a comparison between Moodle and two VLE systems.

**Table 5: Comparison based on focusing on the Technical Aspects of the VLE Systems**

Category Product	ATutor	ILIAS	Moodle
Architecture	Weak	Complex	Good
Implementation	Weak	Complex	Good
Inter-operability	Bad	Good	Good
Cost of ownership	Medium	High	Free
Strength of Community	Low	Medium	High
Licensing	GPL	GPL	GPL
Internationalization	Weak	Average	Good
Accessibility	Excellent	Bad	Average
Document Transformation	No	Average	No

Table 5 displays that Atutor, while strong in features and usability, has serious architectural limitations and, although some features in Atutor warrant further investigation, it may be that candidates will opt for Moodle.

ILIAS, while promising, has a complex architecture with tight coupling that is hard to work with and debug. The code is new, and lacks maturity. The developer community of ILIAS is small outside the core team. Some features in ILIAS deserve to be reviewed before opting for Moodle.

Moodle has a good architecture, implementation, inter-operability, and internationalization, and also has the strength of the community. It is free and its accessibility is average. On the other hand, it has limitations, notably lack of SCORM support, and its roles and permissions system is limited. However, these limitations can be fixed, and are part of the project roadmap [13].

**3.2.2. Second Study.** Table 6 shows the comparison between four VLE systems. The comparison is based on categories as [23] has selected them. This study has proved that Moodle outperforms all other systems and scored 4.467 out of 5. In contrast, Boddington gained the lowest score, at 2.439.

**Table 6: Comparison based on some VLE Features and Categories.**

<b>Product</b> <b>Category</b>	<b>Moodle</b>	<b>Sakai</b>	<b>ATutor</b>	<b>Boddington</b>
Functionality	1.25	.75	.25	.25
Usability	.8	.8	.6	.65
Documentation	.645	.465	.54	.54
Community	.6	.384	.24	.288
Security	.42	.34	.28	.42
Support	.4	.15	.35	.15
Adoption	.352	.336	.208	.336
<b>Score (0 out 5)</b>	<b>4.467</b>	<b>3.225</b>	<b>2.468</b>	<b>2.439</b>

Moodle has nearly the maximum score because it has many of the features expected from an e-learning platform, including forums, resources, quizzes with different kinds of questions, and a number of activity modules. Furthermore, Moodle is very beneficial for language teaching and learning because the interactive tools, such as wiki, discussion forums, and quizzes, can be selectively employed to meet the objectives of the course and to motivate students.

**3.2.3. Third Study.** In [17], the study reports that the result of the evaluation shows that Moodle has the best rating in the adaptation category; it can be seen in Table 7 as the best system concerning adaptation issues. It dominates the evaluation by achieving the best value five times. The strengths of Moodle are the realization of communication tools, the creation and administration of learning objects, the comprehensive didactical concepts and the tracking of data. In addition, the outstanding usability of Moodle leads to the maximum evaluation value in the usability category. Concerning the other platforms, ILIAS obtained the best values in the categories for technical aspects, administration, and course management.

**Table 7: Results of the Adaptation Category**

<b>Feature</b> <b>Product</b>	<b>Adaptability</b>	<b>Personalization</b>	<b>Extensibility</b>	<b>Adaptively</b>	<b>Ranking</b>
ATutor		#	#		3
Dokeos		0	*	+	2
dotLRN	+	+	*	0	2
ILIAS	+	#	*	0	2
LON-CAPA	+	#	#		2
Moodle	#	+	*		1
OpenUSS	#	#	#	0	2
Sakai	0	0	*	0	3
Spaghettilearning	+	#	+	0	3

Moodle has gained the best results, especially in the specific adaptation evaluation. It supports an adaptive feature called “lesson” where learners can be routed

automatically through pages depending on the answer to a question after each page. Furthermore, the extensibility is supported very well by a documented API, detailed guidelines, and templates for programming. In addition personalization and adaptability features are present in Moodle.

## 4. Discussion

This paper is aimed at taking the right decision when choosing a suitable VLE platform to meet the requirements of Qassim University. This is a large university and needs a strong VLE that meets all its needs. This is an initial study to aid Qassim University in that search for the best VLE system. It has focused on a comparison between Moodle and other VLE systems, and is based on two kinds of comparison. The first phase is based on the features and capabilities of VLE, and the second is based on the technical aspects of the VLE tools.

The first study compared Moodle with nine VLE platforms based on features and capabilities of VLE tools, as in Section 3.1. This study has proved that the best platforms are Moodle and Sakai, which have missed just two out of forty features. The weakest product is Claroline 1.6, which missed 8 out of 40 features. Desire2Learn and ANGEL Learning Management Suite have taken the number two spot equally as they both missed three features. Blackboard Learning System and OLAT are number four equally as they both missed five features and capabilities.

The second study compared Moodle with other VLE platforms based on the technical aspects of VLEs, as in Section 3.2. In general, this study has strongly recommended choosing Moodle as the optimal VLE platform for Qassim University.

The first and second studies have proved that Moodle has the best results. In addition, it has the advantages mentioned in Section 2.1, and we therefore strongly recommend Moodle as the best choice for higher education generally, and for Qassim University in particular.

## 5. Conclusion and Future Work

Moodle is a kind of VLE and it is now widely used all over the world by schools, institutes, universities, companies, independent educators, and home schooling parents. It has great potential for creating a successful e-learning experience by providing an abundance of excellent tools that can be used to enhance conventional classroom instruction in any VLE system. Moodle can scale from a single-teacher site to a more than 50-thousand-student university.

This paper has made a comparative study between Moodle and other VLE systems, and this was based on two kinds of comparison. The first phase was based on the features and capabilities of VLE tools, and the second one was based on the technical aspects of VLE systems. From this paper, we aimed to discover the best and most suitable choice of VLE systems that would meet the requirements of Qassim University. In this, our initial assessment, we have succeeded in finding that optimal VLE platform, and it is Moodle.

This paper has presented the work that has been done to date. The future work is to work hard within Moodle and to test it with a sample by using departments in some colleges at Qassim University in order to discover all possible problems that could occur when using it. Initially, there will be a survey for obtaining information directly from different sources, including participants who are in a position to provide such information. Many variables will be considered at this point and the study will attempt to identify the relationships among such variables.

To collect the necessary information, we intend to use personal interviews with people in the following positions: the general instructor of Qassim University and his assistants, course tutors (especially those who teach in VLEs), students (especially those who are on VLE courses), and other staff members who are working at Qassim University. A questionnaire will be sent to any available instructors, teachers, students and staff members for about 300 samples.

## 6. Acknowledgment

The authors wish to acknowledge contributions from many people, including M. Dougiamas who is the author of Moodle. Also, J. Filip, M. Solanki, and M. Langhoff. We also acknowledge those individually with whom we discussed issues that are addressed in this paper, including A. Al-Marghilani, B. Zafar, R. Obaid, A. Al-Zahrani, A. Al-Gamdi and O. Al-Hassan.

## 7. References

- [1] A. Toth, P. Pentelenyi, and P. Toth, *Virtual Learning Aspects of Curriculum Development in Technical Teacher Training*, in *Proceedings of Intelligent Engineering Systems*. 2006, IEEE: London, UK.
- [2] G. Tortora, et al., *A multilevel learning management system*, in *Proceedings of the 14th international conference on Software and knowledge engineering*. 2002, ACM: Ischia, Italy.
- [3] Y. Sugi, et al., *Web-based Rapid Authoring Tool for LMS Quiz Creation*, in *Proceedings of the ITHET '06. 7th International Conference on Information Technology Based Higher Education*, 2006, IEEE: Ultimo, Australia.
- [4] J. Bruce and N. Curson, *UEA Virtual Learning Environment*, P.e. report, Editor. 2001: Norwich.
- [5] M. Dougiamas. *Moodle*. 2008, www.Moodle.org.
- [6] M. Berry, *An investigation of the effectiveness of Moodle in primary education*, in *Deputy Head*. 2005, Haslemere.
- [7] J. Massy, *Study of the e-learning suppliers "market" in Europe*. 2004, Final Report, Heriot-Watt University.
- [8] M. Zenha-Rela and R. Carvalho. *Work in Progress: Self Evaluation Through Monitored Peer Review Using the Moodle Platform*. in *Frontiers in Education Conference, 36th Annual*. 2006. San Diego, CA: IEEE.
- [9] Brandl, K., *Are you Ready to "Moodle"?* Language Learning/Technology, Washington, 2005, 9(2), pp:16-23.
- [10] Aijuan, D. and L. Honglin, *Ontology-Based Information Integration in Virtual Learning Environment*, in *Proceedings of the 2005 IEEE/WIC/ACM International Conference on Web Intelligence*. 2005, IEEE Computer Society.
- [11] Graham, S., et al., *Building Web Services with Java: Making Sense of XML, SOAP, WSDL and UDDI*. 1 ed. 2001: Pearson Education. 450.
- [12] Martin, D. and T. Peter. *Interpretive analysis of an internet-based course constructed using a new courseware tool called Moodle; Quality Conversations. Proceedings of the 2002 Annual International Conference of the Higher Education*. Perth, Australia: 2002 conference.
- [13] H. Wharekura-tini and k. Aotearoa, *Technical Evaluation of selected Learning Management Systems*, 2004, IT Limited, Open Polytechnic: New Zealand.
- [14] Cole, J. and H. Foster, *Using Moodle: Teaching with the Popular Open Source Course Management System*. 2 ed. 2007: O'Reilly.
- [15] B. Williams and M. Dougiamas, *Moodle for Teachers, Trainers and Administrators of Remote-Learner.net*. 2005, Moodle.org
- [16] M. Dougiamas, *Moodle: Virtual learning environment for the rest of us*. TESL-EJ, 2004. 8(2): p. 1-8.
- [17] Sabine, G. and L. Beate, *An evaluation of open source e-learning platforms stressing adaptation issues*, in *Proceedings of Fifth IEEE International Conference on Learning Technologies*. 2005, IEEE: Ischia, Italy.
- [18] A. Chavan and S. Pavri, *Open Source Learning Management in Moodle*. *linux journal*, 2004, 1(2): p. 78-97.
- [19] J. Itmazi, *Flexible Learning Management System To Support Learning In The Traditional And Open Universities*, 2005, Granada University, Spain.
- [20] S. Shearer, *Open Source Software in Education*. 2003, The Compton School: London.
- [21] Cheng-chao. Su. *An Open Source Platform for Educators*, in *Proceedings of the Fifth IEEE Advanced Learning Technologies*. 2005: IEEE Computer Society.
- [22] EduTools. *Course Management Systems*. 2007 Available from: <http://www.edutools.info/>.
- [23] Sclater, N. *Moodle: Transforming Learning Transforming Institutions*, in *Moodle Regional User Group Conference*. 2006. London: Packt Publishing.