

Enhancing E-Learning System in Qassim University by Implementing Moodle as a Tool

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Summary

Moodle is a considered vital e-learning tool at the Computer College, and for many courses at Qassim University. Previous to its implementation, there were many difficulties relating to course management, such as finding suitable times for all students to participate in tests, checking answers, giving feedback to the students as soon as possible, organizing registration for courses, providing course materials and delivering faculty announcements. In this paper, 71% of students studying Introduction to Information Systems at Qassim University were satisfied when using Moodle instead of traditional teaching methods. Additionally, 75% of the Computer College faculty preferred Moodle over traditional teaching methods. The evaluation results for using Moodle revealed its capacity to effectively support and develop an e-learning system to support Qassim University courses. This study offers an opportunity by yielding data on which to base informed decisions. The researchers selected the well-known Moodle educational project as a case study.

Key words:

Course management system, e-learning, Moodle, virtual-learning environment, open source software.

1. Introduction

Qassim University (QU) (www.qu.edu.sa) was established in 2004 by merging two Qassim branches of the Imam Mohammad Ibn Saud Islamic University and King Saud University. Since the establishment of the university, it has experienced a remarkable increase in enrolment and a significant expansion of faculty and administrative staff.

The main branch consists of five colleges, each offering twelve programs in various fields, three of which are in Information Technology (IT). The university's academic year comprises two semesters with an optional summer semester. The number of students enrolled for the ten programs in the Introduction to Information Systems Course (MIS 231) for each semester numbered 400 – 500. The students were divided into a minimum of two classes, with male and female sections. A team comprising an instructor and five assistants, including a coordinator, was allocated to manage and teach the Introduction to Information Systems course (MIS 231). Thus, managing the course is difficult. The main problems faced by the team are: delivering the source materials, implementing

quizzes and registration for the course, conducting questionnaires, grading work and presenting feedback to students. Many higher education foundations currently use a Course Management System (CMS) as a tool to provide course materials to students, either online or through blended learning [1-6]. A CMS is an effective teaching method that is practical for managing large numbers of students. Therefore, implementation of Moodle can enrich the teaching and learning process.

This paper clarifies the experience of managing a course. The opinions of students and faculty members have been collected by administering a Moodle survey in order to collate feedback about the features used in Moodle and the management of the course.

The paper is organized as follows: section 2 is a literature review; section 3 describes a proposed framework for implementing Moodle, followed by a brief description of the Introduction to Information Systems course (MIS 231) in section 4; section 5 presents the results of the survey; and section 6 presents the conclusion.

2. Literature Review

2.1. E-Learning

E-learning is increasingly becoming essential in our lives, and most individuals have experienced it in one form or another, whether through web-based, online learning or computer-based training. This study will concentrate on higher education, which is a significant stage in any education system. It also demands greater dynamism, adaptability and flexibility in order to be effectively supported, which has greatly increased e-learning requirements for both online teaching and learning [5, 6 and 7]. There are a lot of tools and methods for e-learning, such as web services (YouTube and web storage) and virtual learning environments (VLE) (Moodle and Blackboard). The aim of these tools is to provide educational materials to students in a clear and organized structure. The e-learning environment enables students to have direct access to online courseware, questionnaires, communication tools, course documents, and lecture notes [8].

2.2. E-Learning in Saudi Arabia

As a result of the increased global trend of presenting higher education online, all the universities in KSA have maximized their focus on e-learning. Universities such as: King Saud University (KSU), King Abdul Aziz University (KAU), Al-Baha University, Taiba University, Qassim University, King Khalid University (KKU) and Madinah Islamic University have formal agreements with the National Centre for E-Learning and Distance Learning (NCeDL) to integrate e-learning schemes into their courses. E-learning is considered a modern aspect of learning, although it has roots as early as the 1840s, when Sir Isaac Pitman created postal correspondence courses that were conducted in shorthand. This marked the beginning of using communication infrastructures to expand teaching beyond classrooms [9, 10].

According to Saudi Arabia, e-learning was first introduced by Al-Imam Muhammad IBN Saud University in 1954 [11, 12]. In 1972, some departments in King Abdulaziz University began correspondence studies and an independent unit was founded in 1980. In 1978, King Saud University launched an e-learning program. Two years later a project for education using computer technology began at the King Fahd University [11, 13]. Qassim University introduced e-learning in 2007, by implementing Moodle in the College of Health Science and College of Business and Economics [14].

Higher Education Management (HEM) has remained up to date with educational technology. In 2008, the National Centre of E-Learning Education was established by HEM. In addition, in 2012 it issued regulations and laws governing distance-learning programs. In 2011, Saudi Electronic University was established [11].

2.3. Moodle Platform E-Learning System

The word Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment, which is free, open-source software that has been identified as the simplest and most-used platform in higher education. It is an e-learning platform that supports six different activities: creation, organization, delivery, communication, collaboration and assessment [3, 4, 5, 6, 16 and 17].

Moodle platform has been classified in [18] as a group of two different classes, defined according to a set of functionalities: resources and modules. Resources in digital format can be uploaded to the platform, such as web pages, PowerPoint files, Word documents, flash animations, video and audio files. Modules are components that facilitate interactions between the instructors and their students, such as: databases, lessons, assignments, workshops, chats, forums, news, glossaries, wikis, choices, quizzes, surveys, feedback, SCORMs

(Sharable Content Object Reference Model) and external tools [17, 19].

Moodle is a great tool for teachers because it is a platform to store and locate teaching material easily, and a collaborative online platform that enables teachers and students to learn together. Aside from creating courses, it is also a useful online community that keeps users updated and establishes a global circle of scholars [20, 21]. Many modules can easily be found on the moodle.org website, which is a useful tool that is equipped with engaging video illustrative materials. These tools help make the teaching process more effective [2, 15].

There are thousands of Moodle users all over the world, who utilize a variety of Moodle systems, from a single-teacher site to 40,000-student University site [16, 21]. Even some commercial organizations that have adopted a CSM (WebCT or Blackboard) use Moodle as an alternative. A lot of institutions are using Moodle, such as public schools, private schools, home schools, universities and corporate training institutions. Learners use Moodle range from elementary school students to college scholars and beyond [3, 20 and 22].

2.4. Why Choose Moodle?

The Moodle system has some attractive features that encourage users to use it. For example, it is acceptable in communities and some institutions and it offers a wide number of courses in various languages [7]. It enables users to post assignments, electronic journals, news items and resources, and to collect assignments etc. Furthermore, it is open-source code, which allows users to tailor-make it to their specific requirements. Developers and users can also join and participate in Moodle's discussion forums, sharing tips and resources, posting code snippets, helping new users and discussing new ideas [5, 6 and 15].

Therefore, Moodle was the best choice as the field of research. Numerous other reasons for using Moodle platform are listed below [8]:

1. It is an Open Source Software (OSS), which means Moodle is available for free, and users are able to do whatever they need with it (download, modify, or even share).
2. It is a Course Management System (CMS) that helps teachers with sharing lectures, communicating with students, grading, enriching the teaching process with multimedia content, and creating forums.
3. Moodle is compatible with almost all servers that can use PHP. In addition, users can download it on any computer without needing technical support.
4. Most importantly, Moodle is developed under pedagogy and technical constraint, which makes it helpful in an integrated way.
5. Moodle software is being used by companies, universities, schools, and teachers around the world,

with over 79 million users, from both academic and enterprise fields. The credibility of Moodle is very high. There are currently 66,359 websites from 223 countries that have registered with it, and it is available in 120 languages.

- Moodle has many features: it easy to install, easy to use, easy to maintain and upgrade.

3. Proposed Framework

This paper will introduce a model, to be used during implementation of Moodle, which proposes to replace the traditional educational system and its weaknesses, and promote e-learning with its advantageous features.

The steps in Figure 1 are a proposed model for replacing the current educational system with any other system, as an essential development. The educational system is similar to any other kind of system that needs to be developed, so the following steps are recommended in the proposed model:

- The weakness of the current educational system should determine new requirements.
- The strategy for implementing Moodle as an educational system must be clear and studied, in order to understand the advantages and disadvantages of it.
- The data collected from the previous steps must be analysed in order to determine if the new requirements can be satisfied by the new system (Moodle).
- Here, a case study must be undertaken to determine if the course satisfies most requirements.
- The most important step will be testing the proposed system (Moodle) on the chosen case study. If the previous case study does not contain all the weaknesses of the educational system, the new system could be retested on another case study. If the requirement does not match with the proposed system, then the information collected from the case study must be added to the weaknesses of the current system, in order to choose other system to match the requirement.
- Finally, when the requirement is matched, the new educational system (Moodle) can be approved.

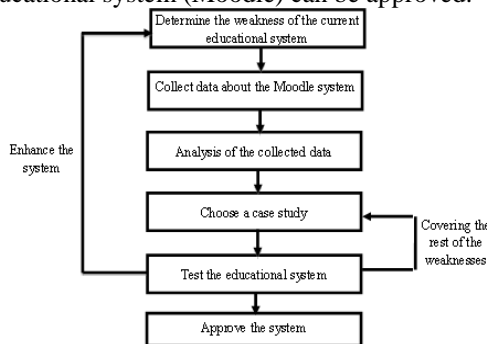


Fig. 1. Enhancing Model of Learning System.

4. Introduction to Information Systems Course (Case Study)

The MIS is an elective course, offered to all students from ten colleges. The number of students in all semesters is about 400-500, who need to be managed manually, and the course is theoretical and does not need any laboratory work. Therefore, it is easier to conduct via the Moodle platform.

Moodle was implemented in QU in early 2008. Although it has not been used formally, it has been used as a personal tool, proving that an e-learning platform is a powerful assistant for both instructors and students.



Fig. 2. The Main Screen.

Figure 2 shows the home screen of the e-learning center at the Faculty of Economics and Administration at Qassim University, which contains the course categories and available courses. The MIS 231 course has team that consists of an instructor and five assistants, including a coordinator, to manage and teach this course. The e-learning tools in Table 1 are used to control the MIS's students and teachers. So utilizing the Moodle system makes the aims of education distinctive and active depending on modern information and communications technology methods.

The ease of using Moodle is a result of the flexible interface's intuitive design, where the left side displays the course name and the right displays some useful services such as a calendar and news. By clicking the course name, the user can access any information about that particular course. Each course page consists of three columns: the right column displays news, the left column contains tools, and the center contains the course contents and activities, as shown in Figure 3.



Fig. 3. The main page of the MIS 231 course.

Table 1 shows some functions of the Moodle platform that are used in the MIS 231 course. These activities are divided into five categories: (1) Course Delivery Tools, (2) Productivity Tools, (3) Communication Tools, (4) Student Involvement Tools, and (5) Technical Specifications. These categories contain many activities, as shown in Table 1. An in-depth explanation of these activities is as follows:

1. Assignments: Students can enter assignment text directly; submit essays, spreadsheets, presentations, videos etc. The instructor can collect students' work, evaluate it and provide the grades.
2. Lessons: Lectures can be provided as docs or in a .ppt file format.
3. Quiz: The instructor can design and build quizzes with a variety of questions, arranged randomly from a pool of previously submitted questions.
4. Reports: These allow administrators to set up arbitrary database queries to act as ad-hoc reports. Other users can have access to a list of queries.
5. Online Grading: The teacher can record, track and calculate grades and provide feedback to students in the form of comments, which can be standardized using a scale.
6. Student Tracking: Instructors can monitor student performance and issue the necessary reports.
7. Calendar: Located in the upcoming events block, which displays future events and/or deadlines in a list generated from the calendar, providing links to event/activity details or directly to an activity.
8. Attendance: Use the attendance block to record students' attendance at classes and activities, and to report on attendance.
9. Chats: This function allows students and teachers to have real-time, text-based discussions in an online chat room.
10. Forums: This is an online discussion board where teachers and students can post messages to each other and keep track of individual discussions.

11. News: This can be used to make general announcements.
12. Survey: The instructor can gather feedback from students using a pool of previously submitted survey questions.
13. Group work: The instructor can create a set of groups for the course. Groups that belong to the course can be added to and removed from any of the groupings that have been created for the course.
14. Database: This enables users to build, display and search a bank of recorded entries on any topic, and to share a collection of data.
15. Backup: A course can be saved with some or all of its parts by using the backup block.

Table 1: E-Learning Tools in Moodle

E-Learning Tools	
1) Course Delivery Tools	
1.	Assignments
2.	Lessons
3.	Quiz
4.	Reports
5.	Online Grading
2) Productivity Tools	
1.	Student Tracking
2.	Calendar
3.	Attendance
3) Communication Tools	
1.	Chats
2.	Forums
3.	News
4) Student Involvement Tools	
1.	Survey
2.	Group work
5) Technical Specifications	
1.	Database
2.	Backup

5. Results and Discussion

In this section, this study will explain the effects of QU's use of Moodle by analysing numbers extracted from the survey. The survey was undertaken by 30 academic faculty members and 528 Introduction to Information Systems undergraduate. The students were asked to complete a survey of 15 questions in the final lecture using the Moodle survey function. The questions are shown in Appendix 2. The faculty survey was made up of 9 questions and distributed to a wide range of faculty members who teach courses to various numbers of students.

5.1 Sampling

There is no agreement among researchers about a suitable sample size [23]. States that around three hundred samples should be adequate while more than five hundred is a good sample and more than thousand will be more preferable.

As a minimum, a sample size should contain between one hundred and two hundred observations. However, he argues that it is inadequate even for a complex model to have only two hundred observations [24]. Indicate that most research studies employ two hundred and fifty to five hundred cases.

In the light of this discussion, the sample size of this study was estimated based on the recommendations of [23, 24]. Therefore, the study decided to satisfy the sample size requirements based on these assumptions by attempting to collect more than five hundred responses.

5.2 Faculty Survey

The survey was presented to a wide range of faculty members who teach various courses in the Computer College, including graduate courses. The project scheduling between students and instructors was difficult, particularly with groups, thus it was important to consider this problem in the survey.

The faculty survey questions are shown in Table 4, in Appendix 1. The survey revealed that 100% of the faculty prefer using technology, and 80% clarified that this is due to the ease of communication between students and their instructors, and the ability to collate all materials for students and send any additional resources in any format. Moreover, 70% confirm that it is easier to communicate with female students using Virtual Computer Resources (VCR) rather than traditional methods. VCR is considered the only available communication method besides email, which causes problems in communicating with each student, especially in the case of any fault or stop working of the VCR.

It is important to note that the percentage of participants who do not prefer to use e-learning technology in teaching is dependent on age. Younger people are more inclined to use technology than older ones.

In addition, Moodle has aided scheduling between students and their supervisors, so they can meet any time they need, even out of official working hours. The supervisor can also have a look over the tasks of projects, even the programming tasks, using Moodle’s special tools [1].

Table 2: Faculty Survey

Survey's Questions				
No.	Agree	Not Sure	Disagree	
1	25	0	5	
2	16	6	8	
3	20	0	10	
4	20	7	3	
5	23	4	3	
6	19	7	4	
7	25	0	5	
8	16	6	8	
9	a	26	3	1
	b	17	8	5
	c	23	5	2
	d	27	2	1

Table 2 and Figure 4 clearly show that the idea of course management systems is not new to over 65% of the faculty, and many have used some, such as Blackboard, WebCT and Moodle.

The survey has confirmed some features of Moodle, such as the practicality and time-saving for instructors by 83% and 52% respectively, particularly when managing exams for huge numbers of students.

The students’ interactions with the instructor are considered satisfactory.

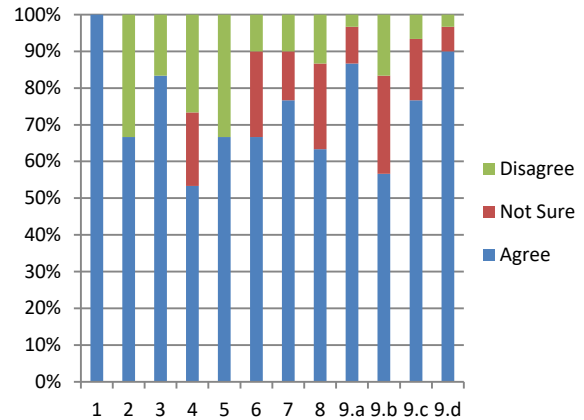


Fig. 4. Results of the Faculty Survey.

5.3 Student Survey

The student survey questions are shown in Table 5, in Appendix 2, and the results are positive with regard to using technology and Moodle in particular. A negative point uncovered in this survey is that the use of technology in teaching depends on the applications that participants are forced to use by the university, which means there is no curiosity or inclination to search for any alternative learning or teaching tools.

The students’ responses in Table 3 and figure 5, 6, 7 and 8 indicate that the majority of students prefer to use computer and e-learning tools, and 84% of students attest that Moodle enables easy access to the courses, has a favorable design, represents a valuable source of information, is a good e-learning tool, and makes it easy to take part in tests.

In total, 89% of students confirmed the simplicity of navigating Moodle, and 81% of students have used the Moodle application on their mobiles. Of those, 77% have used most of Moodle’s support tools, and 71% claim to have changed their study style to be more in line with an e-learning system rather than traditional methods. And 6 answers mentioned that Moodle is similar to some programs as Blackboard, Edmodo, Pbwork, Skype, Google chrome, Class marker Finally, 97% of students are satisfied with Moodle.

Table 3. Student Survey

Survey's Questions (Part One)			
No.	Agree	Not Sure	Disagree
1.	12%	22%	66%
2.	26%	21%	53%
3.	71%	15%	13%
4.	62%	17%	21%
5.	90%	-	10%
6.	77%	11%	12%
Survey's Questions (Part Two)			
No.	Agree	Disagree	
1.	80%	20%	
2.	89%	9%	
3.	97%	3%	
4.	84%	16%	
5.	3%	97%	
Survey's Questions (Part Three)			
Result	The Facilities used on Moodle		
5%	Calendar		
17%	Site news		
14%	Courses (link to all courses)		
7%	Emails		
4%	Library tab		
17%	Assessment tab		
11%	Timetable		
18%	Attendance		
Survey's Questions (Part Four)			
Result	The Uses of Moodle		
3%	To submit work		
5%	Emails		
2%	Library related (catalogue, printing, research etc.)		
9%	To check out the latest news (site news)		
13%	My courses (all course-related info)		
14%	Attendance		
7%	Timetable		
10%	Assessment (grades, deadlines, etc.)		
2%	Calendar		
1%	'Quick links' (Proportal, Hub Careers, Health and Safety)		

On the other hand, 13% of students did not agree that an e-learning system did change their studying style, 12% of the students claimed that a training lecture is needed in order to use Moodle effectively, and 12% of the students had some difficulties with downloading lectures from the system. Furthermore, 3% of students prefer other e-learning platforms. Finally, 43 students have mentioned some technical problem in the network during exam.

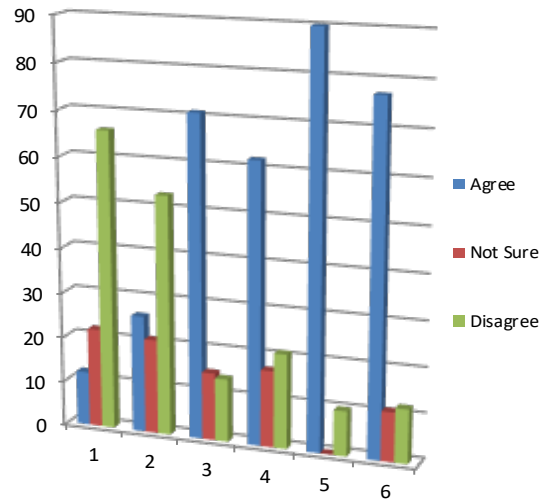


Fig. 5. Survey's Questions (Part One)

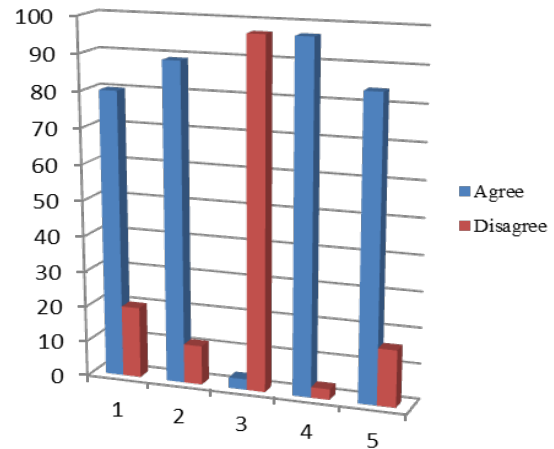


Fig. 6. Survey's Questions (Part Two)

The Facilities Used on Moodle

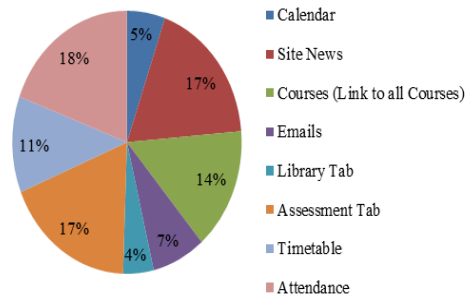


Fig. 7. Survey's Questions (Part Three)

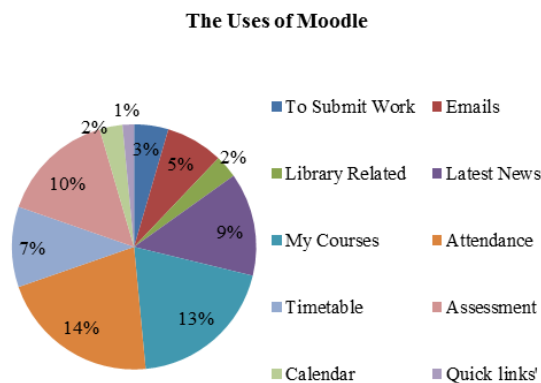


Fig. 8. Survey's Questions (Part Four)

6. Conclusion and Future Work

The aim of this paper is to shed some light on the experience of COC by implementing the Moodle e-learning system for the MIS 110 course, and to identify the advantages of utilising Moodle over the many similar alternatives.

The survey has clarified the benefits and drawbacks of using Moodle as an e-learning system at QU. The advantages can be concluded from the participating students (528 students), with 81% of students using Moodle alongside an available application that is related to the system.

Moreover, the positive results of the faculty survey, about using Moodle in the teaching process, are encouraging. The comments collected from faculty survey show that the practicality of Moodle and its role in solving many problems concerned with MIS 231, or general problems like project scheduling and VCR problems, is clearly the biggest advantage in terms of saving faculty time and enabling teachers to conduct research and improve their courses.

The main conclusion of the research is that e-learning systems motivate students to read and search. The ability to save time enables users to organize and manage courses efficiently.

This survey encouraged general faculty members, outside the university's management, to expand their practices by using an e-learning system. In addition, Moodle has helped students to develop their study style.

A significant proportion of students did not previously use computers as an e-learning system before, which caused difficulties for some. Some students were frustrated by the system because of the slow network speeds of their Internet providers, and they also mentioned a need to receive training on the topic.

Finally, as a recommendation, Moodle should provide an instruction manual or training session for students, at the beginning of the course.

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APPENDIX 1

Table 4. Faculty Survey Questions

No.	Faculty Survey's Questions
1.	Are you using blended learning?
2.	Have you used a Course Management System before?
3.	Is it easy to use Moodle?
4.	By using Moodle it saves my time.
5.	The interaction of the students is better than before.
6.	Can Moodle help you in graduate project courses?
7.	Is using Moodle better than the current method of communication with female students (VCR)?
8.	Would you like to expand the uses of advanced features as computing facilities in Moodle?
9.	How would you rate your agreement with the following statements based on your overall Moodle experience: a. I am comfortable using technology and teaching courses online. b. The organization of the course is easy to navigate. c. In my opinion, I feel that I learned just as well on a Moodle course as I would use traditional, face-to-face methods. d. Overall, I would like to use Moodle in all of my courses.

APPENDIX II

Table 4. Student Survey Questions

Student Survey's Questions	
No.	(Part One)
1.	Do you use Moodle regularly?
2.	Do you need training for using e-learning (Moodle)?
3.	Do you see that the use of e-learning (Moodle) has impacted your study style?
4.	Do you like using computers?
5.	Do you use Moodle regularly?
6.	Please state whether you use the following facilities on Moodle: Calendar, Site News, Courses (link to all courses), Emails, Library Tab, Assessment Tab, Timetable and Attendance.
No.	(Part Two)
1.	Do you use Moodle on your phone?
2.	Is Moodle easy to navigate?
3.	What do you think about the overall look of Moodle?
4.	Are the following advantages available with Moodle: providing easy access to courses, good design, good source of information, an effective education tool, and enables users to perform exams easily?
5.	Are there any other websites you use, that you like the look of/like using, that you feel Moodle could be more similar to? If your last answer was 'yes', please name the program
(Part Three)	
Determine the facilities used on Moodle (you can choose more than one).	
(Part Four)	
What do you use Moodle for the most (this can be more than one thing)?	