

# Teaching Online: Using Moodle for a Blended Course

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## ABSTRACT

*The purpose of this paper is to articulate the use of a server-based software package designed to allow educators to provide collaborative activities and learning resources to online students, as well as supporting face-to-face learning. After providing a discussion on the course management systems and Moodle, the author describes the rationale why Moodle has been selected to be integrated into a blended research course at an American Pacific island university. This is a pilot implementation of mixing e-learning with face-to-face classroom learning in the graduate education program. Based on the qualitative data (self-reported perceptions of students about online experience), the author discusses the use of Moodle mainly from students' point of view, and concludes by setting future directions for design research in the online course based on constructivist perspectives.*

## INTRODUCTION

In 1993, there was no World Wide Web. Today, it seems as if it is everywhere.... Is it any wonder that so many instructors are both anxious and apprehensive as they try to make sense of this new phenomenon? There are so many questions to answer: What is the difference between teaching "on the ground" and teaching online? What are the fundamental techniques? What kind of equipment or software do you use? How do you assess how effective you are? (Ko & Rossen, 2004, p. xv)

"Teaching online" means conducting a course—partially or entirely—through the Internet; what makes teaching online unique is that it uses the Internet, especially the World Wide Web, as the primary means of communication (Ko & Rossen, 2004). Using new media technology and the Internet offers possibilities to enhance Web-based learning (also known as "e-learning"), which is currently one of the major applications of the Internet. Due to the rapid development of Web-based technologies, increasing bandwidth, decreasing costs, and widening access, online versions of education programs are becoming increasingly popular teaching strategies for universities to adopt (Townsend & Wheeler, 2004). In classroom learning, face-to-face contact can help motivate and involve students in active learning, but in online learning via the new teaching and learning technologies makes materials available anytime and anywhere; in practice, both face-to-face and online programs often rely on transmissionist, teacher-centered provision of information rather than on student-centered construction of knowledge (Wonnacott, 2002): "Students may end up receiving passively both online and in the classroom. Two themes, nevertheless, clearly emerge as the most frequently cited strengths—thus the *personal contact* allowed by face-to-face classroom learning and the *flexibility* allowed by online learning" (¶ 2).

The new educational technologies can be classified in two broad categories: (1) communication technologies are broken down into synchronous (online chat, audio-graphics, whiteboard, online video-conferencing, and live Web-casting) and asynchronous (e-mail, bulletin board, listserv, and computer conferencing) technologies, whereas (2) resources technologies are divided into four levels (Fox, 2005): Level 1 (Web sites, online databases, and online journals); Level 2 (online materials created by teachers, such as notes, syllabi and references); Level 3 (online multimedia courseware packages that include text, graphics, animation, audio, and video); and Level 4 (intelligent tutoring systems, expert systems, online simulations, and virtual reality environment). Fox further notes that because of their prevalence, it is useful to examine where virtual learning environments (WebCT, Blackboard, and Moodle) fit into the above classification.

This paper purports to articulate the use of a server-based software package designed to allow educators to provide collaborative activities, critical reflection, and learning resources to online students, as well as supplementing face-to-face learning.

After providing a discussion on the course management systems (CMSs) and the CMS Moodle (Modular Object-Oriented Dynamic Learning Environment), the author describes the rationale why Moodle has been selected to be integrated into a "blended" course. One frequent question asked when one hears about blended learning (BL) is "What is being blended? Therefore, BL is clearly defined. Based on the student reflection papers on their online experience and their perception about BL, the author discusses the use of Moodle mainly from students' point of view, and concludes by setting future directions for design research in the online course based on constructivist perspectives.

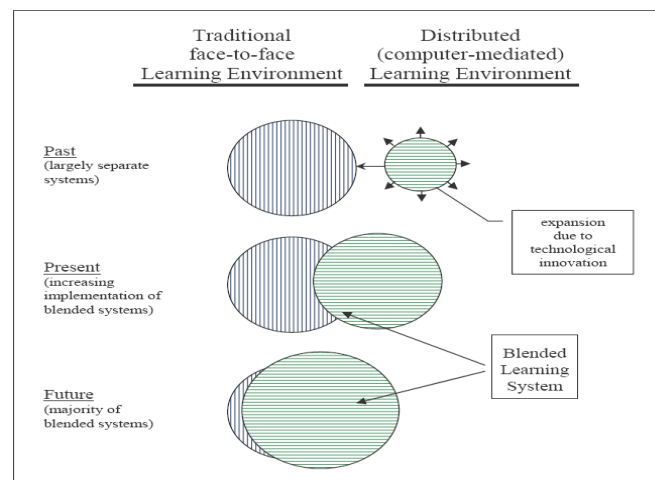
## WHAT IS BEING BLENDED?

The term BL is being used with increased frequency in both academic and corporate circles (Graham, 2004): "In 2003, the American Society for Training and Development identified BL as one of the top ten trends to emerge in the knowledge delivery industry (cited by Rooney, 2003)" (p. 1). While there are a variety of responses to this question ("What is being blended?"), Graham has identified three most commonly documented definitions: (1) combining instructional modalities (or delivery media); (2) combining instructional methods; and (3) combining online and face-to-face instruction. The first two positions above reflect the debate on the influences of media versus method on learning, whereas the third position more accurately reflects the historical emergence of BL systems. BL emphasizes the central role of computer-based technologies in BL as depicted in Figure 1.

## COURSE MANAGEMENT SYSTEMS

Learning software systems, such as CMSs or learning management systems (LMSs), provide the platform for online learning by enabling the management, delivery, and tracking of learning. CMSs, which are often viewed as being the

Figure 1. Progressive convergence of traditional face-to-face and distributed environments allowing development of blended learning systems (Source: Graham, 2004, p. 28)



starting point of any online learning program (Cavus, Uzunboylu, & Ibrahim, 2005), have the unique capacity to capture significant amounts of information about *how* students use the system, *how* they access online activities, and *how* they interact with other students in synchronous and asynchronous modes (Ullman, Peters, & Reimann, 2005).

The rising costs of education often lead to the call for a change from the traditional, space-and-time bound institutions to ones that offer increasingly cost-effective, technologically enhanced programs; as institutions of higher education turn to technology, primarily Internet-based, to address these challenges, the use of “open source” CMSs is dramatically increasing (Minielli & Ferris, 2005). Open source is “viable and significant in the commercial Internet and enterprise ... [but] this new development is less than ten years old and may face significant legal and/or business challenges ahead” (Abel, 2005, pp. 3-4). Some of the best known commercially available CMS systems are Blackboard, WebCT, and Desire2Learn; there are also many open source software and free CMS systems, such as Moodle, Segue, Interact, CourseWork, Atutor, and KEWL (Cavus, et al., 2005). Additionally, “The terms ‘free software’ and ‘open-source software’ are sometimes used interchangeably in the discussion of software ... but free software is not ‘free’ as ‘free’ in the monetary sense, but users of the software should have the *freedom* to run, modify, adapt, customize and share without charge” (Kennedy, 2005, p. 327).

Blackboard—a commercial product produced by Blackboard Inc.—is a mature CMS with a large number of features that support learning and the most dominant CMS provider, whereas Moodle was first released in 2002 and was developed as an educationally sound alternative to Blackboard by Martin Dougiamas of Curtin University (Corich, 2005). Moodle provides many of the tools available within Blackboard, but the user interface is more primitive and the online help is minimal in comparison. According to Corich, the majority of early e-learning adopters in New Zealand decided to use mature CMSs like Blackboard and WebCT but, more recently, many institutes have been looking to the open source community to provide a less expensive and there are a growing number of the institutes looking towards Moodle. Compared with Blackboard, in Corich’s research, students found Moodle easy to use and appreciated the way that Moodle presented materials week by week. In fact, Moodle is one of the popular CMSs, and it has a very large user base with 12,165 registered sites in 155 countries with 4,021,531 users in 376,565 courses as of May 30, 2006 (“Moodle,” 2006).

### THE CMS MOODLE

Dougiamas (2000) implemented using a prototype of a new Web course (titled “Internet Overview”) development tool called “Moodle” that used constructionist referents to model engagement of the participants with course content and each other. Dougiamas notes:

*I was inspired to create a new Web-based tool I could use to implement, modify, and experiment with an interactive internet-based course as easily and as flexibly*

*as possible. I called this tool Moodle .... As a researcher using constructionism as a referent, I needed to develop Moodle to a usable state, then use Moodle itself to develop Internet Overview from a teacher’s perspective. Through interaction with students and the course, I intended to develop new insights as a researcher and perhaps the nature of constructionism (see Figure 2). (¶ 24)*

The system of Moodle is grounded in situated cognition and cognitive flexibility theory that provide the opportunity for an instructor to create a constructivist and constructionist environment to enhance teaching and learning; the abilities to design “student-centered” learning are embedded in Moodle and its modules, but it is ultimately the responsibility of the instructor to make good use of them (Antonenko, Toy, & Niederhauser, 2004). A constructivist perspective, as Dougiamas (1998) describes, does view learners as actively engaged in making meaning, and teaching with that approach looks for what students can *analyse, investigate, collaborate, share, build, and generate* based on what they already know, rather than what facts, skills, and processes they can parrot. As seen in Figure 2, to do this effectively, a teacher needs to be a learner and a researcher, and at the same time to strive for greater awareness of the environments and the participants in a given teaching situation in order to continually adjust their actions to engage students in learning, using constructivism as a referent.

Free open-source is becoming a serious competition to the CMS vendors, but the advantage of open-source solutions goes beyond cost savings as listed below (Yordanova, et al., 2003):

- Moodle allows to be adapted for many operating systems (Windows, Linux, Sun, and UNIX) and software environment (Mysql, Postgresql, MS-SQL Server, Oracle, and Access).
- Moodle can be installed at an institutional server and allows establishment and maintaining of courses from different categories kept in a catalog at a portal page.
- Moodle supports more services than others concerning course activities; the teacher arranges the activity modules in order the students will use them; and editing is possible in any time.
- Course formats give the templates for course settings facilitating the teacher design work.
- There are opportunities for uploading files of various formats that allow usage of materials from previous ordinary courses and easy extension of existing courses.
- Moodle supports many different languages with opportunities to add extra ones.

Moodle provides a range of functionality using such ‘building blocks’ as *Forums, Journals, Resources, Choices, Surveys, and Assignments*. Students can upload their assignments (any file format) to the server, which are then date-stamped. Instructors can keep track of student involvement as well as monitor and get reports on the aspects of the student’s learning. Focusing on how Moodle has been implemented in a hybrid business English course at Kyoto Sangyo University, Baskerville and Robb (2005) describe the following unique components of Moodle:

- *Submission and retrieval system*: There is a common area for students to submit files (‘To Teacher’) in the administration block, and to retrieve files from the teacher (‘From Teacher’).
- *Attendance*: This feature logs the time of initial access to a course area; the instructor can view the attendance for the entire semester and download the results as an Excel file.
- *Class resources*: This feature provides data that students need to complete an assignment.
- *Class quizzes*: Moodle allows the teacher to set when students may begin a quiz and how long they have to complete the quiz.
- *Class activities*: Activities are to reinforce what students have been learning and to help them with current assignments.
- *Calendar*: Notes can be posted to the calendar to remind students of assignment due dates.
- *Participants*: Students and teachers in the course are shown on this page along with how much time has elapsed since they last accessed this page.
- *Forums*: This area allows communication among students or between students and teachers.
- *Logs*: The feature is flexible enough to report the results of all activities for all students down to checking one particular activity of an individual student.

Figure 2. Diagram of affective relationships between the instructor’s roles as teacher and researcher, course software, the course and students (Source: Dougiamas, 2000)

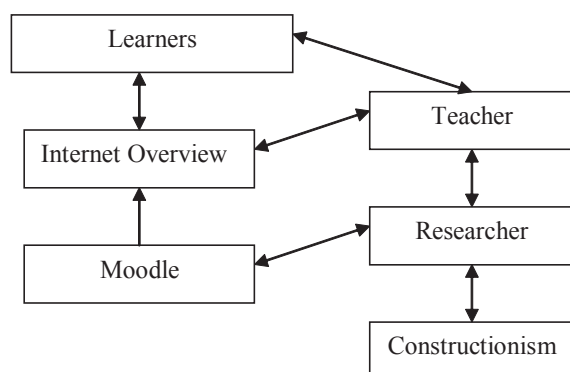


Table 1. Moodle features and activities in the blended research course

Categories	Learning activities	Moodle 'building blocks'
Instructor Presentation	This includes lectures, simulations, charts, and graphs, as well as computer assisted presentations using tools like PowerPoint.	<i>News Forum</i> – Instructor's welcome message <i>Resources</i> -- PowerPoint slides for each week's lecture
Discussion	Guided discussion sections are common format for discussion. In seminars, instructor presentation and discussion are often combined.	<i>Forum</i> – Students participate in a weekly online discussion and a weekly online exercise
Group-oriented and individual projects	Collaborative activities are included here, in addition to group and independent projects presented to the entire class.	<i>Assignment</i> : Students upload weekly assignments, and submit online
Research	Research may be conducted either by individuals or in groups (e.g., practical applications, fieldwork and interviews).	Students develop their research proposal and submit online (but present it orally in class)
Assessment	This involves exams, essays, and projects; portfolios that combine different types of work; and evaluation for participation.	Scoring guidelines and rubrics are used, in addition to student participation in Moodle activities

Adapted from Ko & Rossen, 2004, p. 48

### USING MOODLE FOR A BLENDED COURSE

The School of Education at an American Pacific island university has been the early adopter of Moodle, and training has been offered with small-groups assistance to provide faculty the skills needed to prepare course materials for online learning. The author of the present paper is one of those trained and has taught a blended graduate research course (titled "Introduction to Research Methods") using Moodle in the fall of 2006. This is the first implementation of mixing e-learning with face-to-face classroom learning in the teacher education program. The course is scheduled to teach entirely online in the future. Moodle has been selected for the implementation because of its *flexibility*, *efficiency*, and *cost-effectiveness*, as previously discussed in this paper.

This research course provides an overview of the concepts and applications used in educational research, with a focus on knowledge of research methods necessary to obtain valid and reliable outcomes as solutions to educational problems. The detailed course syllabus indicates the instructor's planned learning outcomes, and student practice, as well as how mastery is assessed. Student work is evaluated based on scoring guidelines and scoring rubrics. Incorporating an active learner model ('constructivist' approach), it is hoped that the instructor sends the message effectively so that students feel satisfied with their online experience. It is also hoped that the likelihood of faculty-student interactions may increase by timely feedback. Eventually, various strategies will be experimented to enhance content interaction, including animations, short video segments and interactive activities embedded right into the lecture material. Student surveys (or reflection papers) are conducted at the end of the semester to improve the course constantly.

The activities in most college courses can probably be divided into a few large categories (Ko & Rossen, 2004); the building blocks of Moodle are used in the course as summarized in Table 1.

### HOW DOES STUDENT LEARNING EXPERIENCE BENEFIT FROM BL?

The aforementioned course was offered in a blended modality (up to 50% on-line)—thus in-class meetings (50%), and online activities (50%). A total of 19 students enrolled in the course and all of them completed the course. Students submitted all the assignments electronically creating 'files.' Students also participated in a weekly online discussion and a weekly online exercise. At the end of the semester, students developed a one-page reflection paper (their perceptions about BL, including their online experience). Typical reflection statements are as follows:

- BL is convenient for the full-time graduate student who is also a full-time employee, simply because it provides a great opportunity for students to work at their own pace.
- Online learning encourages student interaction and electronic contact with the professor beyond the confines of the classroom.
- This virtual platform provides students with the flexibility to complete and submit assignments virtually anywhere.

- Incorporating technology with traditional lecture formats has a positive, synergistic effect on the learning environment for graduate students.
- BL teaches students how to manage time and to be more responsible by setting proper due dates of assignments and other learning activities.

Several students expressed as follows: "the best part of BL is that students not only attend classes, meeting face-to-face with each other and their instructors, but they also can communicate electronically outside of class meetings using Moodle," supporting the characteristic of blended instruction (thus the *personal contact* allowed by face-to-face classroom learning and the *flexibility* by e-learning) pointed out by Wonacott (2002). Regarding communication, face-to-face communication seems to be better for tasks for which students need immediate clarification and explanation, but face-to-face communication appears to be preferable when students need to generate new ideas.

Many of the students in the course are full-time school teachers or administrators. It also should be emphasized that students at the graduate level are responsible enough to study on their own. In this situation, the BL system works very well; accordingly, student reflection papers show that students have satisfied with their online experience. Furthermore, students in the course found that Moodle easy to use and appreciated the way that Moodle presented materials week by week, just as found in the research study by Corich (2005).

Nevertheless, several students pointed out the inconveniences, including inaccessibility to the website, the occasional power outage, and network downtime. The power surges, brownouts, and blackouts people experience in this Pacific island promote more than the usual amount of wear and tear than equipment normally receives, even with proper protection. In addition, lack of adequate air conditioning can allow damage due to moisture, heat, mold, and even insects. Maintenance and replacement parts can be difficult to come by and are expensive.

### CONCLUSION AND FUTURE RESEARCH

The widespread adoption and availability of digital learning technologies has led to increased levels of integration of computer-mediated instructional elements into the traditional face-to-face learning experience. Students' perceptions of using the CMS Moodle are important, however:

*Our focus should be teaching and learning....We must remember that our goals as educators include engaging students in higher order learning, facilitating the exercise of critical thinking skills, and ensuring students' mastery of conceptual, analytical, and theoretical knowledge as well as rather than solely developing students' ability and comfort with the use of technologies. (Minielli & Ferris, 2004, p. 17)*

To effectively utilize open-source CMSs, educators not only need to be aware of terminology, functions, and uses of the most popular types of electronic

courseware, but also they need to develop and critique pedagogically based on research; therefore, “design research” is very important to maximize student learning (Reeves, Herrington, & Oliver, 2005). “Design” really means the *shape* and *direction* the instructor wants the course to take, and the instructor has to keep in mind two design principles (Ko & Rossen, 2004): “to make sure that (1) your course objectives are defined in terms of the learning outcomes that you want students to be able to demonstrate and that (2) you align all activities, assignments, and assessments with those expected learning outcomes” (p. 46). Course designs are also very important to maximize student *online* learning; design research “has grown in importance since it was first conceptualized in the early 1990s...but many researchers continue to conduct studies that principally seek to determine the effectiveness of the delivery medium, rather than the instructional strategies and tasks” (Reeves et al., 2005, p. 96). Design research requires that faculty members should:

- define pedagogical outcomes and create learning environments that address them;
- emphasize content and pedagogy rather than technology;
- give special attention to supporting human interactions and nurturing learning communities;
- modify the learning environments until the pedagogical outcomes are reached; and
- reflect on the process to reveal design principles that can inform other instructors and researchers, and future development projects. (Reeves et al., 2005, pp. 109-110)

Blended instruction is becoming more commonplace in higher education. Through the pilot implementation described in the present paper, it is clear that the requirements noted by Reeves et al. are the necessary steps to enhance the quality and usefulness of design research in the use of the CMS Moodle for a blended course: apply theory to course design, put design into practice, collect and analyse data, and use the results to revise and modify the design. In order to enhance and maintain high quality *blended* or *online* instructional practices, it is essential for instructors to develop and implement specific assessments to evaluate the effectiveness of the teaching-learning process. That is, future studies should examine actual student performance with concrete learning tasks—not perceptions or preferences—in order to see whether these are consistent with teaching and learning effectiveness in the use of course management tools such as Moodle.

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