

MOODLE

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Formative and Summative Evaluation ISLT 9455

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CLIENT

Our client teaches English as a Second Language to Korean Students in Korea at a University. The class he teaches is a typical university class that has 2 lecture hours per week and one lab hour. For the upcoming semester, our client says his classes will consist of 30-40 university freshmen with wide-ranging levels of English proficiency. In general, Korean students are fairly strong in English grammar and reading as the result of spending 8-10 years studying these areas in public schools. They do not have as many opportunities to actively communicate in English, so their productive skills (i.e. speaking and writing) tend to be less developed. He is concerned about student motivation and the classroom resources available to him. He is uncertain if he will require the students to use Moodle this semester until his familiarity with the program increases. The Moodle Site will be used as more of a resource for the students than a primary teaching tool. Our client has not used Moodle before, and is considering using Moodle for the following items:

- class documents (e.g. syllabi, schedules)
- links to supplementary materials (e.g. a video on YouTube, an article in Time magazine)
- class news (e.g. upcoming tests/quizzes, changes of schedule)
- review exercises, module quizzes, exam prep materials
- feedback questionnaires
- possibly a chat room, voice recorder

I believe our client may be open to other uses if we can show how Moodle will enhance his student's experience learning to communicate in English.

By the end of the semester, our client wants his students to look at English as a means of communication as opposed to a subject of study.

Our client has requested that Moodle and his course pedagogy be evaluated in two main areas which would be the **instructional design** and the **content** itself.

In regards to the **instructional design**, our client would be interested in receiving feedback on the usability of the site, including things like:

- Is it easy to navigate?
- Are links working properly?
- Is it logically sequenced?
- Is color used appropriately?

- Are directions unambiguous?
- Is the vocabulary level appropriate for target user group (English as a second language learner)?

As for the **content**, our client would need an expert in the field to assess areas like:

- Are materials (exercises, quizzes, links, resources, etc.) coordinated with curricular guidelines?
- Are their grammatical mistakes or typos?
- Are the exercise tasks and quizzes pedagogically sound?
- Is feedback helpful?

Introduction

The purpose of the Moodle Group is to evaluate Moodle as an instructional tool to help adult English language learners. The first section will deal with essential information on Moodle, its background and purpose. Next, we will outline the purpose of our evaluation, also introducing the client and any other stakeholders involved. The third section will outline the decisions that will be influenced by, and the ramifications of, the switch to Moodle as well as explore the potential impacts of the adoption/integration of Moodle. The fourth section will enumerate the specific questions to be asked in the evaluation. In the fifth section, we will describe the specific procedures used in the evaluation, also specifying the personnel who will act as samples for those procedures. The sixth section will include the actual instrumentation to be used in our evaluation procedures.

We will identify the limitations of the interpretation of the evaluation, and any pitfalls that may result. We will outline the specific evaluators responsible for the various evaluation aspects, as well as a general timeline. There will be a section on the budget and time expenditures incurred by the project. Finally, we will include an executive summary of the project. Our client, Paul Bowers, is also a member of the Moodle Group. The other members are Susan German, William McCrary and Celeste Vanderbrugen

Background

Course Management Systems (CMS) have become a standard component of educational programs in institutions worldwide. In general terms, a CMS is a software package designed to facilitate the organization, administration, and delivery of educational courses through computers. Institutions typically install a CMS on a server, allowing access to educators and students via the Internet, or less commonly an intranet, and therefore fall under the category of

online learning or eLearning. CMSs are frequently utilized as the primary teaching tool for distance learning programs, but have also become popular for onsite, face-to-face courses, where they are most often used to support and supplement classroom meetings. There are both commercially-available and open-source CMSs, the most popular packages at present being Blackboard, WebCT (now owned by Blackboard), Sakai, and Moodle. Both Blackboard and WebCT are commercially-available, or closed-source, CMSs, whereas Sakai and Moodle are examples of open-source (i.e. free) Course Management Systems. To avoid confusion, it should be noted that these packages are variously known as Learning Management Systems (LMS), Online Learning Environments (OLE) and Virtual Learning Environments (VLE, or VEL - Virtual Environments for Learning).

In February 2008 our group agreed to evaluate a Course Management System being implemented by our client, Paul Bowers. Mr. Bowers teaches ESL (English as a Second Language) courses at Hongik University in Seoul, South Korea and has installed a prototype of the CMS to be evaluated at <http://hongik.us>. Our client has selected Moodle as his CMS, citing familiarity and cost as the main factors in choosing Moodle over other options. Since Mr. Bowers teaches onsite, he intends to use this Moodle site primarily to assist him in organizing and administering resources, and consequently views the CMS as more of a support device than a teaching tool. Our client's Moodle site will be implemented for use with his students only and he will administrate and maintain the site himself. His students will access the website through the Internet outside of scheduled class times.

Moodle, as mentioned above, is an open-source Course Management System. It was created and developed by Martin Dougiamas, who remains as Moodle's lead developer and executive director. Mr. Dougiamas became motivated to create Moodle while employed as a WebCT systems administrator at Curtin University in Perth, Australia in the 1990s. With graduate degrees in both Computer Science and Education, Mr. Dougiamas had grown frustrated with what he perceived to be a lack of sound pedagogy underpinning WebCT, as well as other CMSs available at the time. His research in support of his doctoral thesis (titled, The use of Open Source software to support a social constructionist epistemology of teaching and learning within Internet-based communities of reflective inquiry) led directly to the design and development of Moodle, which, Mr. Dougiamas claims, is guided by, and grounded in, a strong social constructionist pedagogy.

The first version of Moodle (1.0) was launched on August 20, 2002. There have been numerous iterations since then (current version is 1.8) and Moodle is bolstered by some 80 developers, translators, and contributors. According to Moodle Statistics (<http://moodle.org/stats/>), there are currently close to 40,000 registered Moodle sites, offering more than 1,700,000 courses to more than 17,000,000 users. There currently are registered sites in 196 countries and there are over 70 available language packs.

Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment, and as the

“M” implies, Moodle consists of separate, but integrative, modules. At present there are close to a hundred supported modules and more than 200 available plug-ins and blocks.

DECISIONS

As evaluation results are known, decisions on how to proceed will be made by the client. The client is primarily interested in gauging the usefulness of Moodle as a Course Management System (CMS), so Moodle’s effectiveness will ultimately be determined by this measure. Upon review of the tracking component of the formative evaluation, the client may need to modify the CMS in order to insure student access to all class documents, supplemental links, and materials. Furthermore, the client may need to address dissatisfaction with the design and other factors related to usability of the website after gathering and synthesizing data from student questionnaires and focus group feedback. Testing the Moodle prototype before full implementation may be effective in ameliorating some of these issues. Using an alpha test group should provide ample formative feedback to facilitate improvements to the CMS in terms of accessibility and usability.

The data derived from the summative evaluation will allow performance comparisons (pre/post testing) between the client’s present courses with Moodle vis-à-vis identical courses taught by other instructors at Hongik University without the use of a CMS. Tracking will also elucidate any correlations between student performance and Moodle usage within the client’s present classes. Additionally, post-course questionnaires and focus groups will assist in determining satisfaction with the CMS and any mid-course modifications. Cumulatively, this information will give the client an indication whether continued use of Moodle is justified. It will also highlight areas where Moodle can be further modified to enhance its effectiveness, should the client decide to extend its use.

Questions

- 1. Are the following resources accessible and functioning properly?** (formative)
 - Class documents
 - Supplementary material
 - Supplemental links
 - Program updates
 - Review exercises, module quizzes, and exam prep materials
 - Chat, Discussion groups, and forums
 - Messages

To evaluate whether or not Moodle operates as intended, the CMS will be put through alpha and beta testing. Alpha testing will be done with a small group of volunteers. Feedback from the alpha test will be used to make improvements to the CMS before students engage in using it. By the time of the beta test, all course materials and resources should be accessible and functional.

2. How and when are students using Moodle? (formative)

Tracking will provide our team with information regarding what materials and resources student access, and how often and for how long students visit the website.

3. What do students like/dislike about Moodle? (formative)

Focus groups and student questionnaires will assist us in determining if target users are satisfied with the layout and design, usability, and usefulness of the website. This feedback will dictate modifications to the website.

4. What problems are users experiencing? (formative and summative)

Focus groups and questionnaires will include a section in which students can report problems with Moodle. Ideally, this section will not garner much data because of well done alpha and beta testing.

5. How has the addition of Moodle affected student performance? (summative)

Comparing the client's students' scores on entrance and exit exams with those of students taking the same tests, but who will not have contact with a CMS, will give some indication of whether Moodle confers students a relative advantage in terms of test performance and presumably language learning.

6. Were students satisfied with Moodle? (summative)

Student questionnaires will provide data on students' level of satisfaction with the CMS, focusing on the client's objectives as criteria (i.e. do the students feel Moodle met the expectations initially established by the instructor).

7. Have modifications improved Moodle? (summative)

Focus group and post-course questionnaire feedback will assist in gauging the effectiveness of changes made to Moodle during the semester.

8. Why were certain areas of Moodle used or not used? (formative and summative)

Qualitative data will be collected from focus group to determine the students' rationale for making the choices they made. Were there characteristics of particular areas of the CMS (e.g. plugins, tools, links, resources, etc.) that either attracted or deterred students from visiting them? Focus groups will be queried on how often and why they did or did not use specific areas of the CMS.

METHODS

Formative Evaluation

No.	Question / Method	Alpha / Beta Testing	Questionnaire	Tracking	Focus group
1	Are the following resources accessible and functioning properly?	X			
	• Class documents				
	• Supplementary material				
	• Supplemental links				
	• Program updates				
	• Review exercises, module quizzes, and exam prep materials				
	• Chat, Discussion groups, and forums				
• Messages					
2	How and when are students using Moodle?			X	
3	What do students like/dislike about Moodle?		X		X
4	What problems are users experiencing?		X		X
6	Why were certain areas of Moodle used or not used?				X

Methods: Summative Evaluation

No.	Question / Method	Pre / Post testing	Questionnaire	Tracking	Focus Group
1	How has the addition of Moodle affected student performance?	X			
2	Were students satisfied with Moodle?		X		
3	Have modifications improved Moodle?		X		X
4	What problems are users experiencing?		X		X
5	How and when are students using Moodle?			X	
6	Why were certain areas of Moodle used or not used?				X

Description of Alpha and Beta Testing

Methods: Formative evaluation (instructor group)

Pre-alpha:

Initial expectations (questionnaire): What are the group members' experiences with using non-Moodle methods of course management? What do the group members expect out of Moodle?

Alpha: Tracking Functionality

Instructor tasks (focus test): Group members are instructed to perform certain course management tasks, such as setting up lessons, adding students, adding tests, and managing files. The members will afterwards rate the experience on a 1-10 scale according to certain criteria, such as:

- ease of task
- time taken/number of steps
- bugs/unwanted behavior
- ease of interface navigation

Members will also write brief remarks after each criterion detailing their experiences.

Student-facing tasks (focus test): 2 phases. In phase 1, group members are instructed to perform certain student-facing tasks, such as creating course pages, administering assignments, and setting up forums. In phase 2, each group member will access one other member's page and perform certain student tasks, such as downloading and uploading assignments, accessing forums, and submitting questions. The members will afterwards rate each separate task experience in the same way as above, with a brief written remark after each criterion.

Post-alpha:

Revisited impressions and improvements (questionnaire): How has your impression of Moodle changed? Rate your impression of Moodle. What, specifically, would you change?

Summative evaluation (student and instructor groups)

Beta: Tracking Usage

Evaluation (usage journal): Each instructor will create a basic course site for a group of students, using resources and lessons learned from the alpha test. Over the test period (shorter than a standard course term), instructors and students will utilize Moodle as they would in a normal course. Each day, students and instructors will fill in a journal pre-printed with each component of Moodle to be evaluated (files, tests, forums, management pages, etc.), briefly describing their usage of any area used that day, noting any particular problems. At the end of the test period, a pattern should emerge that will help answer many usage questions.

Post-beta:

Post-course feedback (questionnaire): Each participant will complete a questionnaire, answering questions about their experience with Moodle. Questions will include rankings of satisfaction, both overall and in various components, suggestions for improvement, and space for other comments.

Final Analysis

Using data from the alpha and beta stages of the evaluation, a recommendation to the client will be formulated.

METHODS

Sample

For the formative evaluation, the participants will consist of our client, other Hongik University instructors teaching the same course as our client, a focus group of target users (i.e. Korean ESL learners, but not the client's students), as well as our client's students. In total this group includes approximately fifty people, including four instructors, eight to twelve focus group participants, and thirty-six of our client's students.

This software has the potential to improve both teacher and student performance, so an in-depth evaluation is called for. Furthermore, including a fairly large ($n > 30$) sample of participants will add validity to our findings. By directly exposing this relatively small group of target users to the Moodle prototype we hope to gain pertinent and significant feedback with, in terms of both time and money, minimal expenditure. This appears to be the optimal sample size considering the client's needs and practical constraints.

The participants in the summative evaluation, excluding the client's four colleagues, will be identical to the formative evaluation group (~50 people). The four instructors who participated in the alpha/beta testing will not have a role in the summative component. However, they will administer pre and post-course tests to their students so those scores can be measured in our Moodle vs. non-Moodle user comparison.

The summative evaluation will be a comprehensive analysis of the Moodle program, with student questionnaires, focus group feedback, and pre/post-test data to synthesize and compare. Included in the summative evaluation will also be a large amount of tracking data, which can be summarized

and exported for spreadsheet analysis using Moodle's "Activity reports" module; making this is a powerful, yet practical, evaluation tool.

Instrumentation

Formative:

1. Alpha / beta testing

The alpha / beta testing will be conducted with four experienced ESL instructors. Participants in this phase of the evaluation will respond to a checklist of items related to the content, instructional design, and management of the CMS. These items will provide an opportunity for the instructors to assess the content that students will interact with (is the site visually appealing and user-friendly in terms of language use and navigation) and teacher-focused areas (grade books, quizzes, exercises, resources, etc.).

2. Questionnaire

The client's students will complete a formative questionnaire focusing mainly on their likes and dislikes and problem areas. Items will be constructed so as to allow students to either agree or disagree with a statement by responding on a Likert scale (1 = Strongly agree / 5 = Strongly disagree).

3. Tracking

Moodle's "Activity report" utility tracks how long and how often students visit the website, as well as where they choose to visit when once they login. This data can analyzed graphically in Moodle or it can be exported for tabulation in a spreadsheet-accessible format. Furthermore, use of Moodle can later be correlated with performance in the class to elucidate potential associations between time spent on Moodle and higher grades.

4. Focus group

The focus group will be instructed to complete a list of tasks on the website and then be given time to peruse the site as they choose. Following this the group will participate in a moderated discussion with the moderator concentrating on areas of concern uncovered in alpha/beta testing as well as querying participants on the choices they made after completing the tasks. Students will also be prompted to address any issues the moderator may have overlooked. The entire session will be videotaped for subsequent analysis.

Summative:

1. Pre / post-test

Entrance and exit exams will be conducted in both the client's Moodle-assisted and the client's colleague's Moodle courses to quantify any conferred benefits. These will be objective tests to avoid any potential scorer bias.

2. Questionnaire

The client's students will complete a summative questionnaire focusing mainly on their likes, dislikes and problem areas. Items will be constructed so as to allow students to either agree or disagree with a statement by responding on a Likert scale (1 = Strongly agree / 5 = Strongly disagree). The summative questionnaire will also include items regarding modifications to Moodle made in response to student feedback on the formative evaluation.

3. Tracking

Moodle's "Activity report" utility tracks how long and how often students visit the website, as well as where they choose to visit when once they login. This data can be analyzed graphically in Moodle or it can be exported for tabulation in a spreadsheet-accessible format. Furthermore, use of Moodle can later be correlated with performance in the class to elucidate potential associations between time spent on Moodle and higher grades.

4. Focus group

The focus group will again be instructed to complete a list of tasks on the website and be given free surfing time. A moderated discussion will again follow, with the focus this time being placed primarily on the mid-course modifications. Again, participant post-task choices will be queried and remaining issues discussed. The entire session will be videotaped for subsequent analysis.

Logistics

William McCrary will be responsible for creating the questionnaires, forms, and other instruments. He will analyze and organize the information from the usage tracking journals in the formative and summative evaluations. He will also remotely monitor Moodle usage by each test group, then analyze and organize this information.

Paul Bowers will administer the instruments during the formative evaluation, and be the main point of contact for the group members in that evaluation. He will also collect and organize the information from the questionnaires following, and will organize and administer the focus group portion of the eval.

Celeste Vanderbrugen and Susan German will be the main facilitators and points of contact for the summative evaluation groups. They will divide up the instructor/student groups, administer and collect the necessary instruments, and organize the questionnaire information. They will also organize and head up the focus groups following the evaluation.

Budget

The Moodle group consists of 4 class members. Our client, Paul Bower, is also a member of the evaluation group. The budget prepared makes estimations on the cost of preparing the questionnaires and transcribing the data from focus groups. The reality is that if Paul is to complete the evaluation on his own, he will be volunteering his time and relying on volunteers from the classes to participate in focus groups and surveys.

Pre Alpha testing: Questionnaire

2 hours x \$25.00/hour = \$50.00 to construct, administer, and compile data from the questionnaire

Alpha testing: Usability testing and Questionnaire

2 hours per person x 4 people x \$25.00/hour = \$200.00 for participants to perform instructor tasks with Moodle and to respond to questions regarding those tasks.

4hours x \$25.00/hour = \$100.00 to construct, administer, and compile data from the usability testing and questionnaire.

Post Alpha testing: Revisited questionnaire for participants

2 hours x \$25.00/hour = \$50.00 to construct, administer, and compile data from the questionnaire.

Beta testing: Tracking usage

15 hours per person x 4 people x \$25.00/hour = \$750.00 for instructors to construct basic Moodle courses. Instructors will fill out a journal describing usage of Moodle that day for the evaluation period.

Students will also be engaging in the same activity filling out journals on a volunteer basis.

Post Beta testing: Post-course feedback questionnaire

2 hours x \$25.00 = \$50.00 to construct, administer, and compile data from the questionnaire.

Final Analysis: Data will be analyzed to determine if Moodle is effective as a course management system.

10 hours x \$25.00 = \$250.00 to analyze the data from the questionnaires, focus groups, and pre/post tests.

Total: \$1450.00

Limitations:

There are a few constraints. We have no control over the participant's level of experience, perspectives and possible preconceived notions regarding online learning. Students are not being prescreened to determine their level of proficiency with technology, the Internet, course management systems or Moodle itself. It should be noted that we are dependent upon the technology resources being provided and the ability to ensure internet access to the Moodle site itself is out of our control.

The contents and format of Moodle shall be regarded as changeable during the formative evaluation phase. The process has been designed with instructor modification of Moodle as a component, based upon participant input. This adaptability increases the likelihood that the information gathered during the formative evaluation phase will be use to improve the course management system and educational experience. This also means the process is to some degree dependent upon instructor behavior.
