

18. Implementing an Online Learning Environment at a HK International School

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Abstract. This workshop offers participants hands-on training in how to set up a secondary school course in an online learning environment: Moodle (an acronym for Modular Object-Oriented Dynamic Learning Environment). It also reviews the process of implementing Moodle at the American International School (AIS), Hong Kong over the past year, and outlines our future plans. Moodle is a popular free software package designed to deliver an online learning environment offering a user-friendly interface, a large online support community of enthusiastic users, developers and educators at www.moodle.org, and open source availability for custom additions.

AIS is currently using Moodle to assist in the delivery of 16 courses, support the faculty in another 5 areas, and implement a school Intranet. A recent directive from the secondary school administration asks all of the teachers to prepare for a potential school closing due to avian flu by making their course materials available online using Moodle.

One of the co-presenters, Aaron Metz, a recent HKU MSc[ITE] graduate and current IT teacher at AIS, introduced Moodle to the school as a result of his studies. For the workshop the co-presenters, with the help of several PC workstations and Moodle software installed, will demonstrate how Moodle is used and offer opportunities for participants to review the environment on their own.

Software operations demonstrated will include: course creation; developing course materials and resources; the initiation and maintenance of discussion forums; the collection of assignments; and the delivery and marking of assessment tools. Expected discussion will include: the background of Moodle development; the criteria for selecting an appropriate learning environment; proposals for administration; web hosting requirements; software setup; teacher training; the pros and cons of an online learning environment compared to traditional education delivery methods; curriculum delivery options; and an overview of the ongoing Moodle implementation at AIS.

The implementation of an online learning environment is an important method of delivering education using IT. This workshop will provide participants an opportunity to discuss an

ongoing implementation at a HK international school, and get hands-on experience in the use of a popular software package of this type.

Keywords: online learning environment, Moodle, distance learning, social constructivism

1. Introduction

This study focuses on a particular aspect of the implementation of ICT for learning at my workplace: that of an online learning environment (OLE). It is based on interviews with key personnel, observations on my own experience, the ongoing training of teachers, discussions about future plans, and feedback from students.

2. Moodle

2.1 Background and Philosophy

Moodle (an acronym for Modular Object-Oriented Dynamic Learning Environment) is a software system which supports Internet web-based course construction and management. In order to make this possible, it basically functions as a website construction and management tool. Moodle is designed to support a social constructionist framework of education, a pedagogy based on four concepts:

- 1) **Constructivism:** this point of view maintains that people actively **construct** new knowledge as they interact with their environment.
- 2) **Constructionism:** the assertion that learning is particularly effective when constructing something for others to experience. This can be anything from a spoken sentence or an Internet posting, to more complex artifacts like a painting, a house, or a software package.
- 3) **Social Constructivism:** this extends the above ideas into a social group constructing things for one another, collaboratively creating a small culture of shared artifacts with shared meanings. When one is immersed in a culture like this, one is learning all the time about how to be a part of that culture, on many levels.
- 4) **Connected and Separate:** This idea looks deeper into the motivations of individuals within a discussion. **Separate** behavior is when someone tries to remain 'objective' and 'factual', and tends to defend their own ideas using logic to find holes in their opponent's ideas. **Connected** behavior is a more empathic approach that accepts subjectivity, trying to listen and ask questions in an effort to understand the other point of view. **Constructed** behavior is when a person is sensitive to both of these approaches and is able to choose either of them as appropriate to the current situation.

The underlying philosophy of Moodle influences the way the websites are organized, and the teaching resources and activities that are offered are designed to support collaboration and critical reflection on the learning experience. The developer of the Moodle software, Martin Dougiamas, feels that these social constructionist concepts can help teachers achieve a new pedagogical paradigm:

Once you are thinking about all these issues, it helps you to focus on the experiences that would be best for learning from the learner's point of view, rather than just publishing and assessing the information you think they need to know. It can also help you realise how each participant in a course can be a teacher as well as a learner. Your job as a 'teacher' can change from being 'the source of knowledge' to being an influencer and role model of class culture, connecting with students in a personal way that addresses their own learning needs, and moderating discussions and activities in a way that collectively leads students towards the learning goals of the class. (Dougiamas, 2005)

2.2 Open Source Design and Price

An important characteristic of Moodle is that it is an *open source* software project, and the source can be downloaded and installed for free. Because interested developers are allowed to modify and add to the published codebase, this results in an *ongoing development project*, with a large online support group of developers and users at www.moodle.org. Moodle is provided freely as Open Source software under the GNU Public License. Users and developers are allowed to copy, use and modify Moodle provided that they agree to: provide the source to others; not modify or remove the original license and copyrights, and apply this same license to any derivative work.

2.3 Requirements

Moodle software will operate on any computer running Web server software, such as Apache or Microsoft Internet Information Server (IIS). It also requires the widely used hypertext pre-processor scripting language PHP, and a database server (it is developed using MySQL, an open-source database system, but Moodle can operate using many database formats, such as PostgreSQL).

3. Initial Introduction of Moodle at AIS

Prior to the introduction of Moodle as an integrated learning environment at AIS, there was no automated method for online collection of student assignments. The only method in use was to ask students to send their assignments as attachments to emails. Teachers could use

filters on their email software to detect various subject lines, and thus categorize emails into folders for each course. The only method for electronic test delivery was to post them on the school website, a method which had been employed as an emergency measure during the SARS epidemic and the resulting school closure.

At the beginning of the 2004 / 2005 school year the sole IT teacher at AIS, the co-presenter Aaron Metz, began searching for alternatives. As part of his MITE studies at HKU, Aaron did an analysis of Silicon Chalk, a software system designed to support real-time online instruction, including student participation and classroom interaction. While this software performed its specified purpose admirably, Aaron felt it did not support all of the requirements he was looking for, such as assignment collection and test delivery.

One of the AIS IT students had run across a relatively new software system designed to support teaching: Moodle. When Aaron expressed interest in testing it at AIS, the student downloaded the system and set it up on his commercial website hosting server. In initial setup and testing, Moodle was found to offer significant teacher time-saving features, it was easy to get started using, and the price was right: free.

Next Aaron installed and set up Moodle on his own commercial website hosting server, and begin using it to actually support his ongoing IT classes. By the end of the 2004 / 2005 year, Moodle was supporting several IT classes, with an enthusiastic response from the students. That summer one of the AIS math teachers wanted to deliver a Calculus preparatory course online while he was on vacation in France, and the course was developed and administered using the nascent Moodle installation at AIS. The course required 16 MS Word documents to be delivered as assignments, and collected online. Each assignment was supported by a discussion forum. At the end of the course there were two review sessions, each supported by a “Corrections” Journal. Finally the course used a 30-question multiple choice quiz to assess student learning. Overall the student response to the online class was very positive, and the assessment results showed a strong level of subject comprehension. On a more cautious note, this course was preparatory for an Advanced Placement class, so the student population could be judged as more motivated than average.

4. Feature Evaluation

During the summer of 2005, Aaron met with the high school principal, the head of the school, and the network technician to discuss the further adoption of Moodle as an Online

Learning Environment at AIS. He had selected a number of key features of Moodle which he felt were important to its adoption:

4.1 Overall Design

- Promotes a social constructionist pedagogy (collaboration, activities, critical reflection, etc) which is in line with current AIS teaching practice
- Open source design: free download, customizable for future growth at AIS
- Suitable for 100% online classes as well as supplementing face-to-face learning (supports instruction during complete school closure for SARS, avian flu, etc)
- Simple, lightweight, efficient, compatible, low-tech browser interface, which gives cross-platform (Apple / PC) and backward compatibility to older computers
- Emphasis on strong security throughout. Forms are all checked, data validated, cookies encrypted, etc

4.2 Site Management

- Plug-in activity modules can be added to existing Moodle installations, so new activities can easily be added
- Plug-in language packs allow full localisation to any language. Currently there are language packs for over 43 languages.

4.3 User Management

- Standard email user registration method: students can create their own login accounts. Email addresses are verified by confirmation.
- Security - teachers can add an "enrolment key" to their courses to keep out non-students. They can give out this key face-to-face or via personal email etc
- Every user can choose the language used for the Moodle interface (English, Chinese, French, etc)

4.4 Course Management

- Choice of course formats such as by week, by topic or a discussion: focused social format
- Flexible array of course activities - Forums, Quizzes, Resources, Choices, Surveys, Assignments, Chats, Workshops
- All grades for Forums, Quizzes and Assignments can be viewed on one page by the teacher (and downloaded as a spreadsheet file for import into other software systems such as GradeQuick)
- Full user logging and tracking - activity reports for each student
- Custom scales - teachers can define their own scales to be used for grading forums and assignments

4.5 Assignments

- Assignments can be specified with a due date and a maximum grade
- Students can upload their assignments (any file format) to the server - they are date-stamped.
- Teacher feedback is appended to the assignment page for each student, and notification is mailed out
- The teacher can choose to allow resubmission of assignments after grading (for regrading)

4.6 Chat

- Allows smooth, online synchronous text interaction for teacher <-> student, or student <-> student exchanges
- Includes profile pictures in the chat window
- Supports “emoticons” for indication of emotion online

4.7 Choices

- Like a poll, they can either be used to vote on something, or to get feedback from every student (eg research consent)

4.8 Forums

- Different types of forums are available, such as teacher-only, course news, open-to-all, and one-thread-per-user.
- All postings have the author’s photo attached.
- Individual forums can be subscribed to by each person so that copies are forwarded via email, or the teacher can force subscription for all
- The teacher can choose not to allow replies (eg for an announcements-only forum)

4.9 Quizzes

- Teachers can define a database of questions for re-use in different quizzes
- Questions can be stored in categories for easy access, and these categories can be "published" to make them accessible from any course on the site.
- Quizzes are automatically graded, and can be re-graded if questions are modified
- Quizzes can have a limited time window outside of which they are not available
- At the teacher's option, quizzes can be attempted multiple times, and can show feedback and/or correct answers
- Quiz questions and quiz answers can be shuffled (randomised) to reduce cheating
- Questions allow HTML and images
- Questions can be imported from external text files
- Question types include
 - Multiple-choice questions supporting single or multiple answers
 - Short Answer questions (words or phrases)

- True-False questions
- Matching questions
- Random questions
- Numerical questions (with allowable ranges)
- Embedded-answer questions (cloze style) with answers within passages of text
- Embedded descriptive text and graphics

4.10 Resources

- Supports display of any electronic content: Word, Powerpoint, Flash, Video, Sounds etc

4.11 Surveys

4.12 Workshops

- Allows peer assessment of documents, and the teacher can manage and grade the assessment.

5. Current State of Adoption

For the 2005 / 2006 school year the co-presenter Brant Knutzen was employed by AIS to tutor both IT and Psychology classes. As Aaron had just finished his MSc in Education in the MITE program at HKU, and Brant was just beginning the same program, they were both highly interested in the application of IT to the field of Education. Aaron asked Brant to consider delivering as much of his course content online as possible, and for tutoring purposes he demonstrated the course creation and learning activity delivery methods. By the beginning of the school year, Brant had all six of his courses operating online using the Moodle environment. AIS has recently conducted several Professional Development teacher training sessions, with significant portions of time devoted to Moodle training, and assistance in getting course materials delivered online. AIS has also given Aaron five additional “prep” hours in his weekly schedule, which are intended for IT support of the Moodle initiative.

At the start of 2006, AIS is currently using Moodle to assist in the delivery of 20 courses, support the faculty in another 5 areas, and implement a school Intranet. Student response continues to be strongly positive, particularly in the area of the online multiple-choice tests: the students love getting their grade feedback immediately, and the opportunity for improving their grade if repeated attempts are allowed. The lowest satisfaction level is

typically found in the Learning Journals, which most students feel is a waste of time. Despite repeated efforts to convince them of the benefits of reflective thought on the learning process, they largely dismiss it as “busy work”. Overall, students like the fact that they can access the learning environment from school or home, and during school or after-school hours, including the weekends. The online learning environment gives them another feature they really enjoy: the ability to review their grades on all assignments and assessments to date, and thus measure their progress within the course. This may also become an easy way for parents to monitor student’s progress, as well!

Recently the web server installation that the AIS Moodle OLE runs on has shown signs of being overtaxed. A month ago the Moodle system crashed in the middle of delivering an online quiz for one of the author’s IT classes, and was down for several days. The quiz was a new “Adaptive” type offered in the latest version of Moodle: it allows the test-taker to submit each quiz answer individually, and get immediate feedback. While this is admirable from an educational Constructivism viewpoint, it also results in multiplying the number of client demands on the server database by 10 to 20 times!

The commercial website hosting support team where Moodle is installed (in Australia) concluded that the bandwidth requirement and database activity is exceeding the ability of the shared-server installation, and recommended that Moodle be moved to a dedicated server setup. There have also been issues with access to Moodle when the school’s Internet access has failed.

6. The Near View

AIS is currently moving to bring the Moodle web installation “in-house”: installing it on the school web server. This should reduce the latency of system response and increase reliability, but the lack of a dedicated commercial support team may prove problematic. Other staffing issues include the retention of the two IT teachers, who heretofore have led the adoption and training in the use of Moodle. Their continued and continuous support of the effort to move the school curriculum online is crucial to its success.

A recent directive from the high school principal, Simon Mann, asked all of the teachers to prepare for a potential school closing due to avian flu by making their course materials available online using Moodle. He recognizes that a long-term school closure will be catastrophic to the school curriculum without a successful adoption of an online learning environment to provide an alternate method of course delivery.

7. Conclusion

AIS is currently evaluating the possibility of making the entire school campus a Wi-Fi “hotspot”. This ubiquitous Internet access, combined with the current trend for students to have email access on their cell phones, PDAs, and laptop computers, is enabling the possibility of having all of the AIS students online constantly at school. The impact and reach of the Moodle learning environment could therefore be extended to include announcements, fire drills, school sports results, and real-time academic competitions and discussions.

As broadband access becomes universal, delivered in both wireless and wired methods, the inclusion of audio and video in the online teaching curriculum becomes possible. The widespread adoption of the Internet2 specification, and the buildout of the infrastructure required, will allow high quality IP-based, real-time large-format videoconferences across vast distances. Educational partnerships between countries, cultural exchanges between students, and highly effective forms of distance learning are becoming possible, and may soon become expected. Online learning environments such as Moodle are the precursors of the future foundations of educational constructs which will shape and sharpen the minds of generations to come.

References

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