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# Implementing Learning Design by lams to improve teaching and learning

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**Abstract:** Learning Design has the potential to revolutionize e-learning by capturing the process of education, rather than simply content. By describing sequences of collaborative learning activities, Learning Design offers a new approach to re-use in e-learning.

E-learning has a well developed approach to the creation and sequencing of content-based, single learner, self-paced learning objects. While definitions of Learning Design vary, the main elements tend to include greater focus on context dimensions of e-learning, a more activity based view of e-learning, and greater recognition of the role of multi-learner environments. While Learning Design does not exclude single learner, self-paced modes of elearning, it draws attention to a wider range of collaborative e-learning approaches in addition to single learner approaches.

This paper shows an example, which is applied to speciality of economic and rural development agricultural engineer at University of Debrecen and its implementation in the Learning Activity Management System. We created a learning design was implemented at this speciality with LAMS, which is a learning design editing and play back tool that puts the learning process, rather than collections of content, at the heart of e-learning

**Key words:** e-learning, Moodle, Learning Design, Learning Activities, LAMS

## 1. Introduction

Online courses are moving into the mainstream and the software commonly used to deliver online courses can be prohibitively expensive. Classes take place online through the use of software packages that have special classroom features such as discussion forums calendars, chat rooms, where participants can communicate in real time with each other, and quiz and polling capabilities. Files such as word processing documents, sound files, pictures, and videos can be uploaded to the virtual classroom for viewing by students. Thus, the “platform” is essentially a place that looks like a private website and is intended to work like an electronic classroom. The classes taught on these platforms are accessible via the Internet, and are usually private, meaning that only individuals who are registered for the class can see the password-protected website. A platform for online courses may also be called an LMS (Learning Management System) or LCMS (Learning Content Management System).

Learning Design has the potential to revolutionize e-learning by capturing the process of education, rather than simply content. By describing sequences of collaborative learning activities, Learning Design offers a new approach to re-use in e-learning.

E-learning systems should be designed in a way that they provide easy access to all levels of learning objects from atomic to the most complex structures in the learning process. (Cebeci et al., 2005)

For the e-learning community, the “learning object (LO)” has emerged as the most dominant concept among various approaches and methods in asynchronous Web based teaching and learning (WBT/WBL). LOs can be any electronic file format such as text, image, graphics, audio, video or an interactive program. (Cebeci et al., 2008)

## 2. Moodle at the University of Debrecen

Moodle (Modular Object-Oriented Dynamic Learning Environment) is a software package for producing internet-based courses and web sites. It is an ongoing development project designed to support a social constructionist framework of education.

Moodle is provided freely as Open Source software (under the GNU Public License). Basically this means Moodle is copyrighted, but that you have additional freedoms. You are allowed to copy, use and modify Moodle provided that you agree: to provide the source to others; to not modify or remove the original license, and apply this same license to any derivative work. Moodle will run on any computer that can run PHP, and can support many types of database.

We have been using Moodle at the University of Debrecen, Business- and Agricultural Department since January 2007. Moodle has more and more function at our Department in education. In January 2008 we introduced

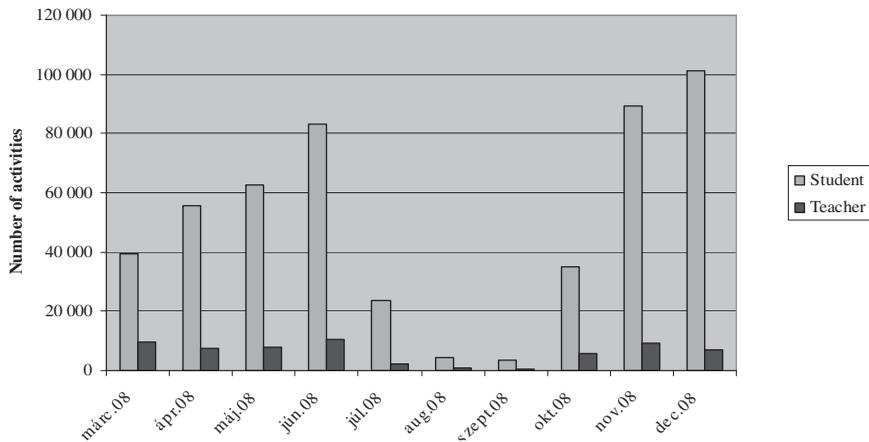


Figure 1: Statistics of a Moodle system in the number of activities

Moodle in our Faculty. Therefore, we gave lessons for the tutors about the usage of the Moodle. Our aim was to develop such a learning system, which is an integral part of educational process (Lengyel et al., 2008).

We used the Moodle in classworks in the framework of 5 subjects in the beginning, in the 2nd half of the 2006/2007 academic year. In the informatics category the number of the active courses increased to 17 in the 1st half of the 2007/2008 academic year.

We showed Moodle system on the courses organized for the instructors where we took an introduction of the system and where we outlined the function of the system and its applicability. The aim of the course was to make our trainings more coloured and more efficient, and the rest of the departments of the faculty use it in the educational process with our vocational support.

We use the system in BSc, MSc, PhD and Erasmus trainings. Our department took advantage of the functions of the framework system in a training and NODES Project beside this (Herdon et al., 2008).

Currently 91 instructors of the 6 departments of the faculty – on 26 specialisations with 167 courses – use the system, through which more than 3600 students were involved in the educational process. On the Figure 1 there is a diagram about the usage of Moodle from 2008 March to 2008 December.

### 3. LAMS

LAMS (Learning Activity Management System) is a revolutionary new tool for designing, managing and delivering online collaborative learning activities. It provides teachers with a highly intuitive visual authoring environment for creating sequences of learning activities. These activities can include a range of individual tasks, small group work and whole class activities based on both content and collaboration. LAMS can be used as a stand alone system or in combination with other learning management systems (LMS) such as Moodle.

LAMS provides teachers with a visual authoring environment for creating, storing and re-using sequences of

learning activities. Teachers drag and drop activities into the authoring interface and then join the activities together to produce a learning sequence. This workflow model is what principally distinguishes LAMS from other more content based LMS by providing teachers and learners with sequences of activities with a high level of interactivity and collaboration. LAMS has a wide range of tools designed to be used for a range of pedagogical approaches, by teachers and students with varying levels of technical expertise.

Moodle is an open source course management system. LAMS is to be integrated with Moodle, with LAMS acting as either a course format or as an activity within Moodle. The integration will be done using Moodle 1.8.2 and LAMS 2.0.4. (Lengyel et al., 2007).

### 4. LAMS integrations

LAMS works well as a stand-alone e-learning system. It can also be integrated with other educational software such as a Learning Management System (LMS)/Virtual Learning Environment (VLE), or Student Management System (SMS).

For example, we can use LMS for general course administration and to provide a central webpage for our course. We can then add a link (URL) from this course page into LAMS for sequences of online activities. When students log in to the LMS, one of the links on the course page could read Click here for LAMS activities, and when students click on this link, they are taken into LAMS to choose the relevant activity sequence.

In this example, the simplest type of integration just requires to add a link (URL) on the course page to LAMS server. When students click on this link, they would need to log in to LAMS using their LAMS username and password. This type of integration is possible today with almost all web-based educational software. (Lengyel et al., 2007)

A more sophisticated type of integration is where LAMS relies on the LMS to provide student details to it in the background so that students do not have to log in separately to LAMS. Similar integration is also possible for teachers so they do not need to log in separately to LAMS, and also to make it easier for teachers to author LAMS sequences and add them into the LMS course page directly.

Sophisticated integration requires two steps: (1) initial development of integration software to link the two systems, and (2) configuration of this integration software with your local LAMS system. The second step would normally be conducted by your local system administrators. The first step is the subject of this paper.

The integration between LAMS and other educational software systems are either supported by or approved by the LAMS Foundation and LAMS International. (Figure 2.)

A LAMS Activity Module and a LAMS course format will need to be written for Moodle. They will have access to the Moodle tables, and will be responsible for meeting the requirements of a Moodle tool. They will communicate with the LAMS server via web services. A LAMS Activity Module may be based on the sample module template available from the Moodle.org website or by an existing module. A LAMS course format will also need to be written. This should be done based on the topic course format.

There will be a number of cron-based tasks that will be needed for both the activity and course module. These include

- Adding new users to a lesson, based on recent enrolments (call to a LAMS webservice, updates LAMS).
- Marking a user as left, based on recent unenrolments (call to a LAMS webservice, updates LAMS).
- Get the user's current progress in a LAMS lesson (call to a LAMS webservice). If it has changed since the last event, create a log entry for display in the recent events section.

When a teacher runs the LAMS authoring client (when adding an activity) and the teacher saves a sequence, the Saved message will have a button Close and return to {request\_source}. If this button is clicked, then the LAMS authoring client will close and the list of sequences on the add activity screen will update automatically. So the request\_source should be set to a name that your users understand e.g. Moodle, the add LAMS activity screen.

An integrated Moodle and LAMS will behave in two distinct manners: LAMS running as course format and LAMS running as an activity in another course format.

When the teacher wishes to make heavy use of LAMS to run a number of sequences within a course, they will use the LAMS course format. In this manner, LAMS will occupy the bulk of the Moodle window and will remain in the window while the user is in the course. LAMS will probably be inserted using an IFRAME.

When using LAMS as a Course format, other Moodle activities will still be available. They will appear at the bottom of the screen. Clicking on such an activity needs to pop up a new window, with the breadcrumbs at the top altered to start with the Activity Name. That is, the entries for Moodle and the course name will need to be removed to stop the user bringing up the main course window in the popup window, as that would result in LAMS being displayed twice.

When the teacher wishes to use a few of LAMS sequences within much larger Moodle courses, they may use the activity manner. In this way, the teacher selects LAMS as they would any Moodle activity, uses an activity creation page to link across to the authoring module. Once the activity is created, the lesson is started automatically.

It will display a simple screen in the activity page, similar to the base LAMS screen. It would open a popup window for

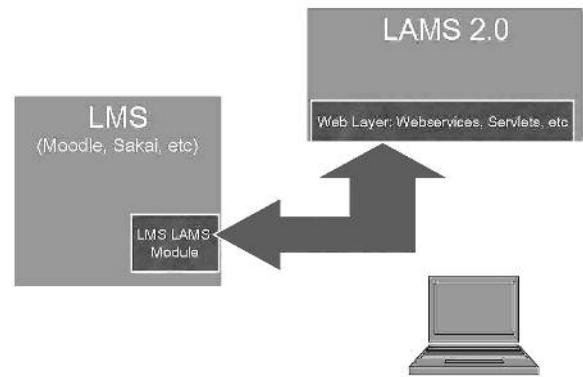


Figure 2. Communication bothways between LAMS and LMS

LAMS. This will allow the maximum amount of screen space for the LAMS interface. As with the standard LAMS, if the user has only one role then the appropriate interface will pop up automatically. If the user has multiple roles then the user will have to select which interface they want.

## 5. Overview of Learning Design

The field of Learning Design is based on the concept of a standardised language or framework to describe educational activities. In particular, it has a special focus on processes that involve group tasks, not merely individual students interacting with content on a screen – rather students interact with each other over a structured series of activities. Learning Design is a superset of Instructional Design, as it incorporates the application of instructional design principles to single-learner contexts, but extends this to include collaborative learning activities and teacher-led environments as additional components of a broader model of education.

To understand how typical Learning Designs are different from other e-learning approaches, consider this generic example: an educator decides to break their seminar/tutorial class into small groups to debate an idea; then each group reports back to the whole class; then the whole class debates the different group ideas; then the educator presents an article from the literature with a new perspective; then, the whole class discusses how their initial debate compares to the article; then, students choose one of three extension topics for further investigation and debate; then each student submits an essay on the topic (Dalziel, 2007).

This design also exemplifies current understanding of good pedagogy by: fostering active consideration of the topic by students, encouraging students to construct their own understanding of the issues; engaging students in a conversation with their peers and with the views of experts; providing student choice within the relevant content, etc. There are many other possible pedagogical principles that could be considered here, such as authentic assessment, negotiation of learning pathways, etc, but the above is sufficient for the current purposes. Further discussion of good pedagogical principles can be found in the higher education teaching and learning literature.

A Learning Design can be thought of as having a number of activities – and for each activity, it is necessary to specify who is involved, what they are doing, and how the task is conducted. These individual activities are then combined to create a sequence of activities, which may incorporate stop points that allow the educator to control the progress of students through the activities. The concept of Learning Design is not just applicable to e-learning; rather, it can be used to describe both online and face-to-face contexts (*Dalziel, 2007*).

## 6. Conclusion

There are many technical and educational challenges yet to be solved, but the success of open education in other areas (open source course management systems and open content) provides hope for finding a solution to the challenge of sharing “open teaching”. We would like to use LAMS to make our education more efficient.

We integrated the Moodle and the LAMS systems. We started to create a learning design which is implemented at an informatics course (speciality of economic and rural development agricultural engineer). We hope that we may make our education more efficient with LAMS usage and the integrated environments might prove to be a very satisfactory platform for online continuing education (*Gaceu et al., 2006*).

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