Can Learning Management Systems Be a Part of Future Learning Spaces?

Stephanie D. Teasley
steasley@umich.edu

School of Information
and
Usability, Support, and Evaluation Lab
Digital Media Commons
University of Michigan
Overview

• Learning management systems (LMS) are ubiquitous in higher education and growing in primary & secondary.

• Are there innovations in instructors' use of LMS? What can LMS offer to the vision of future learning spaces?

• We used the lens of interaction to typify LMS perceptions and use.
USE Lab
Research Team

• Steven Lonn
• Tanya Cleveland Solomon
• Andrew E. Krumm
• Kara Makara
• Diana Perpich
• Pablo Quinones
• Chan Zhang
LMS Growth

- Blackboard: 66%
- Others: 34%

Young, 2008
Registered moodle sites

Some of the growing community of Moodle users are listed below. To add or update your site, just use the "Registration" button on your Moodle admin page. (Note: we check these sites regularly and remove unreachable or invalid sites)

There are 43110 currently active sites that have registered from 210 countries. 7076 of these have requested privacy and are not shown in the lists below.
LMS Growth
Different Types of Interactions

- Different interaction types can lead to different learning outcomes (e.g., Bernard et al., 2009)
  - Learner-Content (LC)
  - Learner-Instructor (LI)
  - Learner-Learner (LL)
- (see Moore, 1989)
Perceptions of LMS Use Across Institutions

- Surveyed instructors' and students' perception of value of LMS activities across 11 American universities
  - Instructors (N = 2,570)
  - Students (N = 6,980)
Survey Items by Interaction Type
Survey Items by Interaction Type

- **Learner-Content (LC)**
  - Post / Access online readings & supplementary materials
  - Post / Access lecture outline before lecture
  - Post / Access lecture outline after lecture
  - Post / Access multimedia materials
Survey Items by Interaction Type

**Learner-Content (LC)**
- Post / Access online readings & supplementary materials
- Post / Access lecture outline before lecture
- Post / Access lecture outline after lecture
- Post / Access multimedia materials

**Learner-Instructor (LI)**
- Send / Receive messages or notifications
- Students turn in assignments
- Instructors return assignments with comments and/or grades
- Students ask questions before lecture
- Students ask questions after lecture
- Give / Take online exams and quizzes
- Post / Access course or assignment grades
Survey Items by Interaction Type

- **Learner-Content (LC)**
  - Post / Access online readings & supplementary materials
  - Post / Access lecture outline before lecture
  - Post / Access lecture outline after lecture
  - Post / Access multimedia materials

- **Learner-Instructor (LI)**
  - Send / Receive messages or notifications
  - Students turn in assignments
  - Instructors return assignments with comments and/or grades
  - Students ask questions before lecture
  - Students ask questions after lecture
  - Give / Take online exams and quizzes
  - Post / Access course or assignment grades

- **Learner-Learner (LL)**
  - Students work together on a task or assignment
  - Students read / comment on each others’ work
  - Students generate / share instructional materials
  - Instructors create / Students are part of ad-hoc student groups or teams
Multi-institutional Research Questions

• Do respondents' values of interaction types differ between
  • instructors and students
  • university settings (research / non-research)
  • number of courses using LMS, and/or
  • use/preference of IT in courses?
Factors Affecting Interaction

- **Independent Variables:**
  - Instructor/student *(RQ #1)*
  - Research/Non-research university *(RQ #2)*
  - Number of courses one has used an LMS *(RQ #3)*
  - Preference for IT *(RQ #4)*
  - Expertise with computers
  - Frequency of LMS visits
  - Value of LMS
  - Value of IT for improving teaching/learning
Findings

- **Learner-Content (LC)**
  - Students value more than instructors
  - Higher use of LMS = More value for LC activities
  - Higher use / preference of IT = More value for LC activities

- **Learner-Instructor (LI)**
  - Students value more than instructors
  - Higher use / preference of IT = More value for LI activities

- **Learner-Learner (LL)**
  - Non-research institutions value more than Research institutions
  - Students value more than instructors
  - Higher use / preference of IT = More value for LL activities
Residential vs. Commuter

- Look at trends from multi-institutional study in more detail by focusing on just two campuses.

- Also allowed us to look at user log files and qualitative data.
Residential vs. Commuter

- Instructors: 612 residential; 64 commuter
- Undergraduate students: 1,182 residential; 805 commuter

Research questions:
- Instructor vs. Student perceptions
- Differences persist in light of other factors?
- How do user logs compare with survey perceptions?
General Trends

• No differences for instructors between campuses

• Residential students rate most Learner-Content LMS activities higher than commuter students.

• Commuter students rate some Learner-Instructor and nearly all Learner-Learner LMS activities higher than residential students.
User Log Differences Between Campuses

- 1,565 residential campus LMS sites
  287 commuter campus LMS sites
- Aggregated all events by tool for course sites in which student respondents were enrolled.
- Categorized tools by LC, LI, LL
- Differences of average percentage of use across LMS sites by campus.
# Tool Use Differences Between Campuses

<table>
<thead>
<tr>
<th>Category</th>
<th>Tool</th>
<th>Residential Campus</th>
<th>Commuter Campus</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learner-Content</strong></td>
<td>Content Sharing</td>
<td>57.7%</td>
<td>52.4%</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>Drop Box</td>
<td>4.8%</td>
<td>2.6%</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Learner-Instructor</strong></td>
<td>Email Archive</td>
<td>0.5%</td>
<td>0.1%</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Chat</td>
<td>0.8%</td>
<td>1.7%</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Learner-Learner</strong></td>
<td>Discussion</td>
<td>1.3%</td>
<td>3.0%</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>Forums</td>
<td>0.6%</td>
<td>2.9%</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Messages</td>
<td>2.9%</td>
<td>6.2%</td>
<td>3.3</td>
</tr>
</tbody>
</table>
Summary

• Residential students rated & used **Learner-Content** activities / tools higher than commuter students

• Commuter students rated & used **Learner-Learner** activities / tools higher than commuter students

• No significant differences for instructor perceptions between campuses
How Does LMS Affect Use of In-Class Time?

- Open-Ended Survey Item:
  - "Has using the LMS affected how you/your instructors use in-class time? If so, how?"

- Item Sample:
  - Residential campus students (n=1,101)
  - Residential campus instructors (n=602)
  - Commuter campus students (n=682)
  - Commuter campus instructors (n=55)
### How Does LMS Affect Use of In-Class Time?

<table>
<thead>
<tr>
<th>Code</th>
<th>Residential Campus</th>
<th>Commuter Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students</td>
<td>Instructors</td>
</tr>
<tr>
<td>Facilitates logistics</td>
<td>22.3%</td>
<td>19.3%</td>
</tr>
<tr>
<td>Provides access to materials</td>
<td>16.5%</td>
<td>16.6%</td>
</tr>
<tr>
<td>General positive response</td>
<td>8.8%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Changes the content/pace of instruction</td>
<td>7.1%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Facilitates discussion in class or online</td>
<td>1.5%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Preparation for class - students</td>
<td>1.3%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Limited / non-user</td>
<td>0.8%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Does not change</td>
<td>33.9%</td>
<td>34.8%</td>
</tr>
<tr>
<td>Changes negatively</td>
<td>3.8%</td>
<td>7.1%</td>
</tr>
</tbody>
</table>
Learner-Content (LC) Interactions

Students

- "I think LMS makes my instructors more efficient because they do not have to worry about always making announcements in class. LMS keeps the entire class up to date and informed."

- "They can use documents posted in LMS in lectures, and reference reading to make point relating the subject."

- "Yes, it makes it easier for us to review lectures and readings ahead of time. It is easy for the prof to send us notifications."
Learner-Content (LC) Interactions

Instructors

• "Cuts down on the need for spending time on 'class business' e.g. announcements etc."

• "It saves me time from directing them to certain websites, and when I am asked a specific question that requires a very long response, I am able to let learners know that I will post more resources to LMS by the end of the evening."

• "I ask learners to review lecture notes before class so we can spend more class time on activities."
Other Interactions

Students

• "Many questions that learners ask are answered on LMS. This makes for more efficient use of class time." (LI)

• "Well yes, usually what we cannot get done or talk about in class, she posts a discussion topic on line." (LL)

Instructors

• "In some classes, discussion & group learning can happen online between classes, extending the types of activities we do in-class to time outside of class." (LL)
Negative Responses

• Instructors saw the LMS as not being used by students, negatively affecting students behavior, reducing interaction, and cited technological problems:

"Students use access to LMS as an excuse for skipping lectures."
Negative Responses

• Students mainly blamed instructors' inefficiencies for the negative effects of the LMS on in-class time:

"The only side effect of this centralization is that my instructors have tended to assume that learners are familiar with LMS, that it doesn't need to be explained, and that any problems related to LMS are the user's (i.e. the learner's) fault."
Qualitative Analysis Summary

- Facilitates in-class learner-content interaction, whereas learner-learner and learner-instructor interaction was cited much less frequently.
Qualitative Analysis Summary

• Facilitates in-class learner-content interaction, whereas learner-learner and learner-instructor interaction was cited much less frequently

• Few differences between campus types
  • Residential most popular response: facilitates logistics
  • Commuter most popular response: access to materials
  • Residential: 59% positive; Commuter: 69% positive
Qualitative Analysis Summary

- Facilitates in-class learner-content interaction, whereas learner-learner and learner-instructor interaction was cited much less frequently

- Few differences between campus types
  - Residential most popular response: facilitates logistics
  - Commuter most popular response: access to materials
  - Residential: 59% positive; Commuter: 69% positive

- Differences between instructors and students in how they perceive LMS affect on class time
  - Students saw problems where instructors did not, e.g., "They move too quickly over slides as they will be posted later to LMS"
Examples of LMS Use

- Community Health Nursing
  - Instructor sought materials for data & policy and stories of served populations.
  - Used case-based characters from "The Neighborhood" online resource.
  - Instructor presents the content in combination with the LMS tools.
  - Uses LMS to link to scholarly articles & news stories
  - She posts notifications & reminders and uses assessment tools for rapid feedback.
Examples of LMS Use

- **Principles of Engineering Materials**
  - Introductory course - weekly lecture & discussion section with teaching assistant.
  - Instructor sought way to directly engage students and share his approach to weekly problem-solving assignments.

- LiveScribe system purchased to record instructors' solutions to homework problems.
  - Shares "pencasts" of solutions via LMS.
  - Uses LMS to answer questions during lecture.
  - Meets students on familiar ground (the LMS) while also utilizing unfamiliar engagement technologies to assist learner-instructor interaction.
Examples of LMS Use

- Jazz Arranging
  - Students share original compositions with each other & for credit.
  - Students used to have to perform live or record outside of class.
- Instructor experimented with Sibelius.
  - Compositions archived digitally & files play themselves: focus is on the composition, not the performer.
  - LMS Assignments tool used to collect compositions & grade privately.
- Other LMS tools used to manage logistics.
LectureTools

- Hybrid for LC, LI, LL
- Students **take notes online** - synchronized to lecture slides
- Instructors **ask students questions** during & after lecture
- Students can **answer each others' questions** & view seat map to **create groups** for projects.
- Next version: cloud tags of students' notes - what are students' finding most salient in lecture?
Conclusions

- Across campuses, LMS are seen and used by instructors & students today for mainly supporting learner-content interaction.
- Very few courses use the learner-learner oriented tools.
- All activities rated highly. Some rated more highly by students compared to instructors.
- Higher ratings for users with more LMS experience and greater preference for IT in teaching and learning.
- Reduces some of the differences between campus types.
However...

- There are indications that LMS is affecting in-class time and there are growing examples of courses using LMS to maximize learner-instructor and learner-learner interactions, as well as richer learner-content interactions.
Future Learning Spaces with LMS

• As seen in examples, instructors are "mashing up" external technologies with LMS (Severance et al., 2008).

• As Web 2.0 matures, continued mashing in order to maximize LI & LL interactions.

• LMS as portal, central, familiar online space where learning begins and is facilitated by the instructor.
Thank You

Stephanie D. Teasley
steasley@umich.edu

School of Information
and
Usability, Support, and Evaluation Lab
Digital Media Commons
University of Michigan