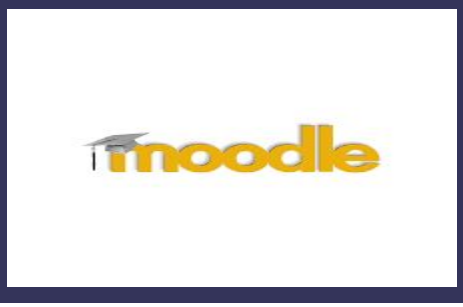
Teachers College

Learning Management Systems



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Background

The College is looking to build a 21st century technology infrastructure that will support the faculty's ability to leverage technology to sustain and enhance the college's intellectual future. With this goal in mind, we need to challenge our assumptions about the learning management systems that are used by our faculty and students across the college. Currently we have three main Learning Management Systems that are used at the College:

1. Moodle
2. Blackboard
3. Canvas

Others, including Schoology and Google Classroom, are used by a few faculty and programs. It is important, as we look to scale to a consistent and coherent online learning environment, that we look to consolidate our Learning Management Systems and adopt a single system that will meet the criteria outlined below.

1. Build a system around faculty and student needs
2. Ensure ease of use for both students and faculty and one that is well supported
3. Take advantage of pedagogical adaptability
4. Provide a system that allows robust integration with other College systems and incorporation of modules and programs that faculty and students deem useful
5. Enable learning analytics with the ability to mine data in a variety of ways.
6. Provide a system that allows innovative pedagogy at a reasonable and predictable cost

Even with the adoption of a single platform strategy, we must allow for innovative pilots of new products, but with the understanding that they will be limited in scope until such time as they are proven to be a superior environment through consensus of faculty and students.

History of current LMS platforms at TC

The college acquired BlackBoard around the turn of the century to support our Distance Learning Project. A number of faculty began using it at that time and have continued to use it for both online learning and face to face classes. Some new faculty coming to the College had used BlackBoard at their previous institutions and due to their comfort with the Platform, have chosen it as their preferred TC system. Consequently, the number of courses offered in BlackBoard have remained fairly constant over the years. The College has switched from hosting the program locally to contracting with BlackBoard for this service. Over the years, faculty have become comfortable with the program and service requests are infrequent.

Moodle was acquired as the replacement for ClassWeb (Prometheus developed at George Washington University) which had become the default LMS for the College. Moodle is an open source product and the most widely used program world wide with people contributing code to improve the product constantly. The College contracted with a higher ed IT support company to implement Moodle, but after numerous early implementation problems which caused distress for faculty and students we switched to another vendor which has a reputation for excellent support of Moodle and open source products. Through our work with this vendor, we have been able to make changes to the program to accommodate faculty and student requests.

Due to a need to quickly create online programming, especially for the growing portfolio of non-credit courses, multiple departments began investing alternative platforms, for example Schoology and Canvas. Other faculty explored platforms such as Google Classroom and Edmodo. Canvas was adopted by our Arts and Humanities Department as a formal pilot in the spring 2015 semester because it was not feasible to enter students who were not officially enrolled in the College. In the summer of 2016, Academic Technology began piloting Canvas for the rest of the college. In the fall of 2016, Columbia University adopted Canvas as its primary platform, replacing Sakai, the open source program which it has used in recent years. The Unizin consortium of schools including University of Michigan, Indiana University, and Penn State has also selected Canvas as their platform.

Data analytics from the LMS provide insight into how the systems are used. Currently at TC, Moodle hosts the most courses (not including dissertation advisement, seminars and other non-traditional classes). In the fall of 2015 there were 1224 courses in Moodle, 53 in Blackboard, 22 in Canvas. Data indicate that the LMS are used by faculty for multiple purposes. For example, for the courses hosted in Moodle (typically 11-1200 per semester), most have at least a syllabus posted, but those with active use (e.g. assignments, discussions, file uploads) number on the average around 450 per semester. Close to 5000 students log into Moodle during a semester with the average daily unique logins between 1500 and 2000. The typical usage in Moodle as well as BlackBoard and Canvas is heavily weighted toward discussion/forum posts. File uploads, emails sent to the class, and graded assignments are all heavily used features as well. The number of courses held in BlackBoard has remained fairly constant for many years, and courses in BlackBoard are typically active with discussions being the dominant usage. Canvas is very new to TC, so relatively few courses have been held there. File uploads and discussions seem to be the primary usage. See Appendix A for historical usage of LMS.

Comparisons

On October 19, 2016, RFPs were sent to four major LMS vendors: Blackboard, Moodle, Canvas, and Schoology. Vendors were asked to provide costs for cloud hosted versions of their platforms as well as 24/7, 365 Tier 1 support for all TC students, faculty, and staff. Figures were based on an FTE of 3401, as provided by our office of institutional research.

Cost relative to Moodle (current primary LMS at TC)

Canvas	Schoology	Blackboard
57% of cost of Moodle	61% of cost of Moodle	105% of cost of Moodle

Other considerations

Close comparisons of the features of the four LMS platforms revealed that they all have very similar functionality. For a detailed feature comparison, see the table of features drawn from the RFPs. Other considerations need to be accounted for when making a decision. For example, user interface and ease of use were gauged based on qualitative feedback. The table below highlights the benefits and concerns for each LMS, particularly how they will be implemented at TC.

LMS	Benefits	Concerns
Canvas	● Columbia has begun migration to Canvas providing us with better pricing, a larger support community, and the ability for cross registrants to easily access courses from other schools within the University ● Interface learning curve is low due to a design focus on making the platform intuitive to use. ● Tier 1 scalable support is available at a lower cost than the other systems without it. ● Current support materials (e.g., online documentation, instructional videos) are provided by Canvas rather than having to be created by TC staff.	● The basic program features and layout are not customizable, with changes available by integrating other products through LTI integration. ● Canvas does rolling updates throughout the year. Canvas now gives a three week beta period and summary of changes so we can play around with implications and prepare faculty.
Moodle	● Open source code allows customizations and modifications to be made ● The majority of the TC community are familiar with Moodle ● Changes to the program are made with respect to the TC schedule and according to TC needs. ● Moodle has very sophisticated functions (e.g. gradebook and quizzes) ● Integration with Mahara provides ePortfolio with assessment functionality	● Interface is not especially intuitive requiring a moderate learning curve. ● Upgrades to the program sometimes result in changes that break what faculty have set up ● Costs for customization are high
BlackBoard	● One of the oldest and well established LMS on the Market ● Deep in functionality and capability ● Familiarity by faculty	● Data is owned by BlackBoard and not easily accessed directly by TC ● Cost prohibitive
Schoology	● New generation of programs with pleasant easy to navigate User Interface ● More learner centric and holistic than others	● New program with more limited features ● Not widely known here at TC or outside ● Minimal longevity in the market with unknown future

	• Ease of incorporating LTI modules	• More customers in K-12 market, now moving toward higher education

Evaluation of LMS Platforms

The platforms that were considered to be the primary LMS at TC were Moodle, Blackboard, Canvas, and Schoology. Qualitative and quantitative data were gathered through faculty interviews and student surveys. To help evaluate Canvas and Schoology, a formal pilot program for those two platforms was conducted during the Summer and Fall 2016 semesters. There were approximately 90 pilot courses, representing nine of the 10 TC academic departments. The majority of piloted courses used the Canvas LMS. Feedback was gathered from 34 faculty members who piloted an LMS. Academic Technology staff members interviewed each faculty member to gather both quantitative and qualitative data. Student data were collected via the Institutional Research Departments Fall 2016 student survey. There were 1202 students who responded to questions about the TC LMS.

Quantitative data were gathered from faculty and students. Faculty indicated a very strong preference for Canvas, with 94% of respondents stating they would recommend Canvas as the primary LMS for TC. When asked to use a scale of 1-10 to rate specific aspects of the platforms, such as ease of use, communication with students, and discussion, Canvas was rated the highest with an unweighted average rating of 8.49, Schoology with 7.95, Blackboard with 6.89, and Moodle with 5.9. See Appendix B for details. Students were asked to rate the LMS platforms they have used at TC on a scale of 1-5. Of the 1202 students who responded, 1166 indicated they used Moodle and rated it the highest with a score of 3.8. There were 539 students who used Blackboard and rated it with a 3.4. There were 445 students who used Canvas and the average score was 3.6. There were 180 students who used Schoology, which earned a score of 3.4.

Faculty respondents were asked to elaborate on what they liked and found challenging teaching with the piloted LMS platforms. During the qualitative analysis of the Canvas data, a number of themes emerged. One major theme was that faculty consistently described the interface as easy, intuitive, clean, and visually appealing. Faculty noted that is made it easier for them and their students to find what they needed. Another major theme was the use of video in Canvas. Faculty commented on the straightforwardness of embedding video. Additionally, faculty appreciated the ability to record video directly in Canvas. For example, faculty described using the Canvas video recording feature to provide students with feedback. Faculty also liked how Canvas' modules provided a flexible structure for organizing course materials. Faculty found the assessment features of Canvas (e.g. SpeedGrader, assignments, and gradebook) to be convenient and efficient. For example, faculty used SpeedGrader's ability to give student feedback via drawing, highlighting, and recording video comments. Nine faculty members indicated they had either phoned, chatted with,or emailed the Canvas 24/7 support team and feedback about the Canvas service was overwhelming positive. For example, one faculty member stated that there was no comparison to getting help on other LMS platforms and that the 24/7 Canvas support "seals the deal." Respondents indicated concerns with the Canvas email feature, the common Canvas rich text editor, is not available.

Users found Schoology's familiar interface similar to social networks and faculty rated it easiest to use with Schoology earning 8.57 out of 10, Canvas 8.23, Moodle 5.71 and Blackboard 6.36. This worked both for and against Schoology, as some faculty found the interface unfamiliar, and were hesitant to pilot the platform. For

example, one faculty member stated Schoology used a social media model of feeds and they were not interested in teaching that way. Similar to Canvas, the ease of use, online documentation, and clean and simple interface were cited by pilot participants as positive aspects of Schoology. Additional challenges with Schoology were noted by the pilot faculty included students' desire for a calendar view of assignment due dates and a better interface for grouping students in messaging and assignments.

A review of the qualitative data from the student survey revealed that one of the most prevalent theme was students' desire for a single LMS platform for their courses. While many students described Moodle as easy to use, comments about Canvas used adjectives such as more modern, cleaner, aesthetically pleasing, technology friendly, more options, and more potential to describe the platform. Students also noted that the LMS platforms are "only as good as the professor's ability to use them."

Recommendation

CIS recommends adopting Canvas as the primary LMS system for the College. This recommendation is driven by the need to establish a single cost effective system that will be well supported, easy to use, and presents a familiar environment regardless of what course, department or even school at Columbia one is teaching or attending.

The advantages of Canvas as this primary platform are:

- A clean, simple, and intuitive interface
- 24/7 support direct from Instructure, the company which makes Canvas
- Ubiquitous platform for all of Columbia University
    - Common interface for courses offered in different schools
    - Leverage resources from CU support community and experience
- Positive perceptions by both TC faculty and students who have used Canvas
- A cost significantly less than our other LMS platforms

The successful adoption of Canvas is contingent on:

- Clear migration processes for courses to Canvas from other college LMS platforms.
- An aggressive support campaign to aid people in using Canvas

Migration plan

Timeline

- January 2017: Faculty can request for any course to be offered in Canvas
- May 2017: Blackboard shutting down
- Fall 2017: Last semester for active courses in Moodle
- January 2018: Moodle content will be archived and Moodle no longer active

Support

- Face-to-face workshops for students and faculty:
    - Beginning January 2017, CIS will host frequent Canvas orientation sessions for both faculty and students

    - As the semester progresses, CIS will provide more in-depth training on specific features such as video recording within Canvas, plagiarism checking with Turnitin, assignment, rubrics, and the gradebook.
    - CIS will host faculty user groups so faculty can share innovative ways of teaching with Canvas
- Tech Fellows and AT senior staff available for one-on-one for migration of old course content and optimize course design using features in new platform.
- Support available from Canvas for faculty and students, 24/7 via phone, chat, and email.
- Excellent, current online documentation provided by Canvas
- Tech Fellow one-on-one support for faculty
- Online training materials
- 24/7 support from Canvas

Looking forward

This move to Canvas represents an interim step in the process of selecting and supporting academic technology platforms. With growing pressure to create systems that are more student-centered, the learning management systems' market is evolving quickly. As new learning management systems are developed, faculty may choose to utilize a technology that is not the primary platform. In addition, all of the newer platforms utilize the "Learning Tools Interoperability" (LTI) protocol, which allows modules developed independently from a Learning Management System to be easily integrated and used, no matter which platform is the host. It is our intent to work with faculty and students to explore LTI modules and other platforms with an eye toward possible adoption and appropriate timing of any future changes. Academic Technology is available to partner with faculty to systematically evaluate new technologies by gathering data from LMS pilot studies, conducting reviews of next generation learning management systems as well as other promising programs, and providing to the TC community with periodic analysis of the these systems.

Appendix

Appendix A: Historical LMS Usage Data

Platform	Moodle	Moodle	Blackboard	Blackboard	Canvas
Term	Spring 2015	Fall 2015	Spring 2015	Fall 2015	Fall 2015
	Jan. 1 - April 30	Sept. 1 - Dec. 31	Jan. 1 - April 30	Sept. 1 - Dec. 31	Sept. 1 - Dec. 31
Total number of courses	1104	1224	38	53	22
Number of active courses	446	448	38	53	22
Total number of students	4511	4715	495	770	199
Average number of daily unique logins	1460	1732			
Number of courses with at least one assignment	241	213	16	20	22
Number of instructors in all active courses (because professor can change their role and role of TAs, this number is possible an overcount)	508	499	38	63	23
Total discussion/Forum posts	25773	25531	6299	8525	247
Total number of files uploads (faculty & student)	46916	54063	1051	1708	566
Total number of graded activities	14326	51660	70	174	
Traditional assignments submitted	1565	1503	45	55	126
Number of quizzes	60	67	31	34	

Appendix B: Summary of Faculty Survey Results

Platform	Ease of Use	Communication with Students	Discussion Forums	Assessment	Gradebook	Average Score
Moodle	5.71	7.00	5.89	5.15	5.73	**5.90**
Blackboard	6.36	6.46	6.67	7.40	7.57	**6.89**
Canvas	8.23	8.26	8.27	8.81	8.86	**8.49**
Schoology	8.57	7.14	8.75	7.80	7.50	**7.95**