The Recommendation for Canvas as Northwestern’s Learning Management System
by
The Learning Management System Review Group
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Executive Summary of Our Recommendation

After fourteen months of study and eight months of course pilots among eleven NU schools, the Learning Management System Review Group recommends that Northwestern University adopt Canvas by Instructure as its campus-wide learning management system.

The transition from Blackboard Learn to Canvas should begin immediately, in order to give schools that are about to build new course sites for release in summer 2014 the opportunity to develop in the Canvas educational platform with confidence.

An extensive program of training and consulting support for faculty, teaching assistants, and program assistants in Canvas should begin this summer and continue throughout the transition period. In order to shorten the period during which Northwestern students need to navigate course sites in two learning management systems, we recommend that Blackboard Learn be retired at Northwestern in August 2015.

1. Preface

In October 2012, the Educational Technology Advisory Committee (ETAC) indicated that its immediate priority was to identify and advance new educational technology capabilities for Northwestern faculty and students. Many ETAC members reported that the University’s electronic learning environment had become insufficient for effective support of new educational practices in their schools and for encouraging experimentation with various forms of online learning by faculty.

A group of ETAC members began meeting to chart the scope of a review of Northwestern’s commitments in this area. In January 2013, a formal work group of 25 faculty and staff was convened to investigate whether there was a superior educational platform to the system that had been first put into campus-wide production at NU in 1999, Blackboard Learn. The Learning Management System Review Group hosted a series of on-campus demonstrations by leading candidates for a next-generation education platform at Northwestern during the winter and spring quarters of 2013. Five systems were identified as possible improvements to the status quo system, Blackboard Learn: New Blackboard, LoudCloud, Desire2Learn, Canvas, and Coursera.

By the summer of 2013, the Learning Management System (LMS) Review Group had effectively eliminated two of the five candidates. A LoudCloud pilot by a Department of Economics course in the Judd A. and Marjorie Weinberg College of Arts and Sciences had shown that the LoudCloud system, while greatly ambitious in its goals for achieving adaptive learning, required much more staff support for any one course instance than could reasonably be provided for a campus-wide education platform. The economics course suffered at least two outages of the cloud-based LMS system. A pilot by the Northwestern University School of Law of the Coursera platform for a distance learning course proved much more promising. However, the Coursera platform is currently optimized for conducting massive open online courses (MOOCs) and it is probably several years away from being able to integrate well with other University systems such as the Office of the Registrar data feeds, University Library content services, and classroom technologies. The Coursera platform also presents difficulties for distributed administration among Northwestern schools. Northwestern is continuing its use of the Coursera platform
for MOOC efforts, and the University is consulting with Coursera development teams about evolving the Coursera system in ways that will allow frequent offerings of small private online courses (SPOCs) in the future. But this desired evolution of Coursera appears, for now at least, to be a few years away before it can be done at a campus-wide scale at Northwestern.

That left three candidate systems for serious consideration by the LMS Review Group during the 2013-2014 academic year: New Blackboard, Desire2Learn, and Canvas. Although there were individual advocates within the Review Group for each one of these three LMS candidates, by June 2013 a majority of the members of the Review Group were most impressed with the features of Canvas. The Review Group expressed interest in seeing the capabilities of Canvas (from the company Instructure) put to the test within a broad spectrum of Northwestern pilot courses during the 2013-2014 academic year. The Review Group asked Northwestern University Information Technology (NUIT) to put in place an aggressive schedule of support for Northwestern pilot courses with Canvas, beginning in August 2013 and expanding in scope for the fall quarter. The Review Group also recommended that “sandbox” instances of New Blackboard and Desire2Learn be provided to Northwestern faculty for sampling.

As a result of the very positive experiences reported by students and faculty from the Canvas course pilots since August 2013, paired with the tepid reaction of Northwestern faculty to the sandbox instances of New Blackboard and Desire2Learn, we are advancing a recommendation to ETAC that the University adopt Canvas by Instructure as its primary educational technology platform. The following sections of this report will describe in more detail our findings during 2013-2014 with Canvas, leading to our confident recommendation for Canvas as Northwestern’s learning management system.

2. Faculty Assessment Results

The 54 faculty who took part in the Fall 2013 and Winter 2014 pilots support the idea of the University switching from Blackboard to Canvas. At rates of 93% (fall quarter) and 76% (winter quarter), or a cumulative rate of 82%, faculty participants favored switching from the current Blackboard platform to Canvas. Only 5% (N=2) of the faculty survey respondents over two quarters favored staying with Blackboard.

Early on, the LMS Review Group heard concerns that faculty at Northwestern might be unwilling to spend the time necessary to learn a new learning management system. More than half of the pilot faculty reported that learning Canvas took two hours or less. The amount of time a faculty member spent building a course in Canvas varied, with slightly fewer than half of them building a course in one to five hours. Neither of these estimates, we hope, will dissuade faculty from adopting Canvas.

One faculty member commented about Canvas, “Canvas supported my pedagogy much better than Blackboard, allowing me to construct the course the way I wanted. The flexibility and ease of use helped me build much better two-way communication with students. If I could summarize: I DREAD returning to Blackboard if the university decides not to switch.”

Please see Appendix A for details of the fall and winter faculty survey results.
3. Student Assessment Results

The students who took part in the Fall 2013 and Winter 2014 courses in Canvas expressed a very decided preference for Canvas over the current implementation of Blackboard Learn. Students consistently chose Canvas over Blackboard at a rate of 74% (N=372), with 15% (N=75) favoring remaining with Blackboard.

For the students, learning Canvas generally took around 30 minutes. Students found learning the system easy and there were several comments along the lines of “It’s easy – you just have to play with it a bit.” Students prefer an in-class demonstration from their instructor, showing the Canvas website and the general organization of course materials as the best way to be introduced to the system.

Students in the pilot classes often commented favorably on the free mobile apps for Canvas. They saw this aspect of the system, plus its clean design, as a welcome change from their experience in Blackboard.

*Please see Appendix A for details of the fall and winter student survey results.*

4. Learning Metrics

Instructure has recently released support for formal learning standards assessment as an optional part of the Outcomes services in Canvas. Learning standards can be imported into Canvas for state, Common Core or local university standards. This Canvas feature is today most frequently used in K-12 settings, but it can provide useful metrics for students’ progress to higher education standards if a university (or individual faculty member) imports these standards into Outcomes.

Experience with standards during the Northwestern pilots has been limited. Nevertheless in the winter quarter faculty were asked if they used the feature and/or felt it was useful. One Northwestern faculty member tried it and said they felt it was helpful. Of the 27 faculty who did not use it, 19 felt it was not important but 8 said they would like to try it in a subsequent course. One faculty member did not understand the question.

In the winter quarter, the 38 pilot faculty were also asked if they used the feature providing analytics on student experience of (or reactions to) the course and whether they found it useful. Seven faculty said they used this feature, 6 of whom found it useful while one did not. Of those who did not use the feature 15 faculty said they would like to try it in a subsequent course and 7 said they did not feel it was an important feature.

Given the limits of our investigation to date into this dimension of the benefits of any LMS, the question of Canvas’s impact on student learning outcomes remains mostly an open issue. Nonetheless, we believe it is safe to say that, as an adaptable, and user-friendly product with the LMS market’s cleanest design, Canvas enhances instructors’ capacity to focus on and innovate in their teaching, which can have a positive effect upon students’ learning experience.

5. The Technology Platform

Canvas has proven itself during the Northwestern pilot process to be a modern, adaptable and reliable educational technology platform. The following is our appraisal of the primary technology characteristics of the Canvas software platform.

- **Core Architecture.** One of Canvas’s greatest advantages is its core architecture. Its web services are built primarily upon Ruby on Rails operating upon a PostgreSQL database, deployed ever since its original release in 2011 on Amazon Web Services (AWS) as Software as a Service (SaaS).
modern architecture, along with Canvas's multi-tenant support, helps to account for the superior record of nimble execution and updates by Instructure’s developer teams that push out improvements, fixes, and new features for Canvas on a three-week release cycle. This three-week release cycle is much quicker than the release history experienced by Northwestern with Blackboard Learn.

- **High Availability.** There have been no unplanned service outages of the Canvas production platform since Northwestern began using it for pilot courses in August 2013.

- **Open Source Release.** Although the LMS Review Group recommends that Northwestern subscribe to the SaaS cloud service for Canvas, it is important to note that Instructure releases a version of Canvas as open source software under an Affero General Public License. It appears that Instructure does not intend to cede development authority for the cloud service to an open source higher education community. However, it does allow for open source developers to more easily integrate applications into the Canvas application and it provides a safety plan, of sorts, in the unlikely prospect that Instructure would cease production of Canvas. The Canvas source code is available on a GitHub site.

- **Support of Learning Tools Interoperability Standards.** Learning Tools Interoperability (LTI) is an open standard from the IMS Global Learning Consortium for securely integrating external learning tools, services, and resources into courses in a Learning Management System (LMS). This important standard enables and is indeed fostering a rich and growing assortment of available tools and services that faculty can use in their courses. Canvas organizes many of these tools (135 LTI applications as of April 2014) in the platform directly for browsing and selection by faculty. For examples of LTI Apps, see the Edu App site also hosted by Instructure. Canvas also supports manual integrations, as well as automated configurations of LTI application suites. Automated configurations are only available for certain third party tools that support this feature. During the course of Northwestern’s pilot of Canvas, a manual configuration was successfully performed for an unlisted LTI App requested by KGSM.

The LTI integration features of Canvas were essential to two projects that were completed with the NU Library team for effective support of pilot courses. LTI was used to make Ares Course Reserve content from the Library available to pilot courses; and the LTI standard also was used to link the Library’s Avalon Media System to Canvas pilot courses.

- **Canvas support for critical IMS Standards.** In addition to LTI, IMS Global Learning Consortium sponsors other standards to achieve interoperability in educational systems. The IMS Common Cartridge Specification (CC) defines a package format for migrating content from one LMS to another in a LMS-neutral way. Canvas supports the Common Cartridge Specification. This capability has been used at NU to migrate course content from Blackboard to Canvas. The standard, being deliberately vendor-neutral, results in fairly plain content organization, not always achieving the very best effects of the source or target LMS however.

IMS also defines a similar standard for migrating assessments: Question and Test Interoperability (QTI), which Canvas also supports.

IMS also defines various standards for Student Information System integration. The most recent IMS standard in this area, Learning Information Services (LIS V2), is not yet supported by Canvas.

- **Northwestern SES Data Feed Plans for Canvas.** NUIT has engaged in a planning effort among the Northwestern SES Team, A&RT, and the Registrar’s Office to address integration of the NU Student Enterprise System (SES) with Canvas. The current method of SES-Blackboard integration, put in place for Blackboard Learn over 10 years ago, will not work as a long term solution for Canvas, since it is
Blackboard-specific. A planning effort for SES-Canvas integration has now successfully been completed, and NUIT units are now well into the development stage of the SES-Canvas integration project. We expect a full-scale solution to be ready for testing by June 2014, to replace the Blackboard-dependent solution that has been supporting the Canvas pilots since August 2013.

- **Other Integration Opportunities with Canvas.** Besides LTI Apps and efforts to integrate NU Enterprise Systems with the LMS, Canvas offers other types of service integrations and notifications. These include several well-known and commonly used services for social media, teaching, collaboration, identity, multimedia, and calendaring. The full list is available [here](#).

### 6. User Support Services from Instructure

For the pilot courses in Canvas, Northwestern provided a blend of user support and training services from local support units (NUIT A&RT, Kellogg IT, Weinberg Multimedia Learning Center, NU Library) and a support service contract with Instructure that included continuous, 24/7/365 Tier 1 user support via multiple communication channels (phone, email, and online chat) for all of our faculty, students, and staff.

This hybrid approach to user support works very well for the cloud-based Canvas service, and we recommend that a similar plan be adopted for at least the next few years of production use of Canvas at Northwestern. Responses to the pilot surveys, combined with monthly service desk reports from Instructure, indicate that those members of the Northwestern community who utilized the 24/7/365 service from Instructure had mostly positive experiences. Negative experiences with support centered around the handling of Tier 2 - 3 level issues related to potential bugs, known behaviors, and user account creation.

26 faculty members from the fall quarter and winter quarter pilots reported on their experience with Instructure's support service. Faculty responses were generally favorable, with comments like "With only few exceptions, the support staff are knowledgeable and responsive. When something is a Canvas design issue, they will trouble-shoot ways around it to help you out immediately." Northwestern students in the pilot program contacted Instructure's support service infrequently. (13 of our students, out of 503 total respondents to the pilot surveys, indicated they used Instructure's 24/7/365 service. That is less than 3% of the students who responded to our polls.) Student responses were mixed, with comments like “Some was excellent, some took a long time before I heard a response.” In general, it's a testament to Canvas's clean design and modern user interface that so few of our students felt that they needed any help at all with successfully using Canvas in their NU courses.

During the pilot, Instructure's Tier 1 reporting for Customer Satisfaction and Contact Center Availability indicators have consistently been above 90%. This is in line with informal feedback provided to Northwestern by other universities that are using this service from Instructure. Some examples of dissatisfaction with Instructure’s response to instructors’ requests for help were discussed at LMS Review Group meetings. These deficiencies have been highlighted during bi-weekly conference calls between NU support teams and Instructure support managers. The LMS Review Group recommends that these regularly-scheduled conference calls continue, in order to achieve highest satisfaction levels from NU instructors and students for their experience in Canvas.

We believe ongoing monitoring and coordination between the NUIT Support Center and Instructure's Tier 1 service will be necessary to maintain a positive overall user support experience in Canvas. Efforts are in progress to tighten the coordination between the NUIT Support Center, local NU schools and Instructure support services, including the auto-escalation of tickets passed between ticketing systems, the implementation of “warm” phone transfers between various support groups, a knowledge base for
communicating NU support expectations to Tier 1 agents, and regular ongoing conference call briefings between NU support staff and Instructure's Tier 1 managers.

Instructure Support Terms
http://www.instructure.com/policies/support-terms

7. Mobile Services

An excellent user experience and good access to a campus LMS via mobile devices is a continued point of high priority for our students and faculty. Instructure has released iPhone, iPad, and Android apps for Canvas that have received high ratings from Northwestern pilot students and pilot faculty. The company has developed and published a full set of mobile application program interfaces (APIs) for Android and for iOS 2.0 apps that can interact with Canvas. The inclusion of a full set of mobile application program interfaces (APIs) augurs well for new collaborations and development of enhanced mobile applications in the future, whether created by Instructure or by 3rd party developers. As part of the Northwestern University LMS evaluation process, Instructure sent lead engineers from its mobile development teams to Evanston in November 2013 to help the LMS Review Group better understand Instructure’s commitment to mobile services and its APIs for mobile integration. A deep dive presentation on integration and development opportunities provided by Canvas software engineers was particularly valuable to the Northwestern developer community in understanding the range of services offered and the possibility of future enhancements and mobile developments. Instructure has demonstrated both a stronger track record of delivering compelling mobile applications to the Northwestern community and a stronger, in-house mobile developer team than is the case with other LMS companies today.

8. Security Audits and Security Appraisals of Canvas

Since its release of Canvas in 2011, Instructure has led the LMS marketplace in commissioning annual security audits of its software by impartial, third-party consulting firms. Instructure publishes the auditing firm’s summary security report on the Canvas web site. In November 2013, Instructure commissioned Secure Ideas to perform the third annual security audit of Canvas, and Instructure published the report in January 2014. "Secure Ideas found that with a few minor exceptions the quality and coverage of security controls in the Canvas application were very solid. The Finding Severity Profile...compared to a similar 2012 assessment reaffirms a continued effort towards improvement in the security of the application and coding practices over previous years." The most recent Secure Ideas security audit report is available here.

Canvas has been approved for “General Availability” by Internet2 as a Net+ application offering---the first LMS to successfully pass through this rigorous review of community and industry cloud solutions. The Net+ evaluation subjects candidate software systems to Internet2 universities’ testing and review, including a comprehensive security assessment using the Cloud Security Alliance (CSA) Cloud Controls Matrix (CCM) as the evaluation framework. Internet2 Net+ has also vetted contractual provisions for Canvas regarding FERPA and Business Associate Agreements (BAA) under HIPAA/HITECH data protection standards.

In June of 2013, NUIT conducted its own internal security audit of Instructure Canvas. This audit returned the designation of "Low Risk" for sharing data with Canvas, scoring a 327 in the range of 300 (Low Risk Indicator) to 900 (High Risk Indicator).
9. **Accessibility Services**

Accessibility is one of the key aspects that any potential new learning management system on Northwestern University’s campus must address. Instructure Canvas, on a variety of fronts, has shown very positive results on the evaluation and investigations done here to date. To start with, a very public, direct and open statement on the Canvas website clearly outlines the intent and attention that this company pays to the issues of software accessibility: "Instructure continually strives to make Canvas a great experience for all users by ensuring the accessibility of Canvas. Canvas is fully compliant with US Section 504 & 508 standards. Further, we are committed to WAI standards and are currently re-certifying with the National Federation for the Blind." The Canvas Voluntary Product Accessibility template can be found at [http://www.instructure.com/canvas-vpat](http://www.instructure.com/canvas-vpat). Canvas currently holds a gold standard rating from the NFB awarded in 2010. One indication of the degree that Instructure prioritizes compliance with existing accessibility standards is the attention and focus the company has put towards maintaining the highest standard ratings. In 2013, 159 fixes were requested for accessibility compliance, to date, 149 have been completed. Due to the nature of the ongoing development of the software, this demonstrates dedication to addressing issues in a timely fashion, and bears well for our partnership with this company.

In March 2014, NUIT, in collaboration with the NU Accessibility Office, and its director Alison May, led a direct evaluation of the accessibility of Canvas. Thomas Carroll, an undergraduate student at Northwestern and an employee of the NU Accessibility Office did a live test of the Canvas software and this session was recorded for evaluation. The video record of this test can be seen here: [http://video.at.northwestern.edu/2014/Canvas_Accessibility_Test/03-18-2014_CanvasAccessibilityTest.mp4](http://video.at.northwestern.edu/2014/Canvas_Accessibility_Test/03-18-2014_CanvasAccessibilityTest.mp4).

The immediate feedback from Tommy was definitely positive, especially in comparison with existing products currently in use here on the NU campus and this can be easily seen in the video. Comments from the Office of Accessibility on this test were positive as well, but also caution on the ultimate test being when a production system is put in place with regular use. The Office requests inclusion of the accessibility contract rider on any signed contract with Instructure for the licensing and purchase of Canvas. In conclusion, our research and testing on accessibility to date yield no obstacles to moving forward with Canvas and its place in Northwestern University’s educational technology environment. On March 20, 2014 an analyst from the Gartner Group briefed NUIT on Instructure. The Gartner Group had almost universally positive things to say about an R1 university's impending transition to Canvas in 2014 or 2015. The Gartner Group reports that Instructure is a well-funded company, with over $50M in venture capital funding received during 2012 and 2013 from Epic Ventures, Bessemer Venture Partners, and Open View Venture Partners. Instructure released Canvas in 2011 and three years later has over 600 education customers and more than $90M in annual contracts. The company exhibits very strong software development capacities, modern leadership, a thorough cloud (or SaaS) LMS implementation on Amazon Web Services, and a growing market share, particularly among R1 universities. The biggest unknown on the horizon with this company, says the Gartner Group in our March briefing, is what will be the outcomes from an initial public offering in another year or two. Instructure's Canvas adoption rate during 2012 and 2013 in higher education places it as the fastest growing LMS vendor in higher education, with most of the recent conquest sales coming at the expense of previous customers of Blackboard Learn, WebCT, and Sakai.

11. **Peer Group of Canvas R1 Universities**

NUIT has joined an active, collaborative work group consisting of the lead support units at other R1 universities that have recently moved to Canvas as their campus-wide educational platform. Monthly conference calls among this self-organized “Canvas R1 Peers” group allow for constructive sharing of experience with Canvas among like-minded institutions. Most of the discussion with these peer R1’s
centers around offering support for a range of new education practices on our campuses, including blended learning and online education. This fast-growing group of R1 peers includes Brown University, the University of Pennsylvania, Harvard, the University of Maryland, Indiana University, the University of Texas at Austin, the University of California at Berkeley, the University of Washington at Seattle, and Northwestern University. The Canvas R1 Peers group also offers an excellent opportunity for shared leverage in articulating priorities to Instructure for new features development for Canvas. And the Peers group has already provided valuable information to the Northwestern team on best practices for user support and training, for distributed administration across schools, and for identifying the most successful LTI applications for use with Canvas.
Appendix A: Northwestern Canvas Pilot Courses Survey Results from 2013-2014

The Pilots:
NUIT A&RT, with the help of Kellogg Information Systems and Weinberg’s Multimedia Learning Center, as well as the library, ran a series of pilots during 2013 and 2014. The details of those pilots show that every college except NU Qatar has been involved and students from every rank have been part of this experiment.

Fall 2013:
16 Faculty members
17 classes
690 student enrollments*
Colleges represented:
- Bienen School of Music
- Kellogg School of Management
- McCormick School of Engineering
- Medill School of Journalism
- School of Continuing Studies
- School of Law
- Weinberg College of Arts and Sciences

Winter 2014:
38 Faculty members
38 classes
1300 student enrollments*
Colleges represented:
- Feinberg School of Medicine
- Kellogg School of Management
- McCormick School of Engineering
- Medill School of Journalism
- School of Continuing Studies
- School of Education & Social Policy
- School of Law
- Weinberg College of Arts and Sciences

Spring 2014:
36 Faculty members
42 Classes
1,500 Student enrollments*
Colleges represented:
- Bienen School of Music
- Kellogg School of Management
- McCormick School of Engineering
- Medill School of Journalism
- School of Continuing Studies
- School of Education & Social Policy
- School of Communication
- Weinberg College of Arts and Sciences
*Student enrollments: some students took more than one Canvas pilot course in any given quarter, so they may have been counted multiple times. In addition, enrollment numbers are approximate, as students add and drop throughout a term.

**The surveys of Pilot Faculty:**
At the end of each quarter, A&RT surveyed the faculty and students involved in the pilot classes. Both students and faculty were enthusiastic about the prospect of the university switching from Blackboard Learn to Canvas. The surveys were extensive and the data sets provided a wealth of valuable information. *Since Spring Quarter 2014 is still under way, there are no survey data to report yet.

**Faculty Survey, Fall 2013:** 14 of the 15 faculty who responded to the survey recommended that the university switch to Canvas (93%); 1 person was undecided, commenting: "Need to know what current Blackboard looks like."

[Fall 2013 Faculty response to stay/switch recommendation. N=15]

**Faculty, Survey, Winter 2014:** 29 of the possible 38 faculty members responded to the survey, giving a response rate of 76%.

- 76% (N=22) Switch to Canvas
- 17% (N=5) Don't know
- 7% (N=2) Stay with Blackboard
Faculty Surveys, Cumulative:

Overall, then, of the 44 people who have answered a survey and taught in Canvas:
- 82% (N=36) Switch to Canvas
- 14% (N=6) Don’t Know
- 5% (N=2) Stay with Blackboard

The surveys of the pilot faculty included many other questions, including assessments of features and functionality, how to best help students learn the system, and overall satisfaction with Canvas. Of particular interest to the transition team is the amount of time faculty members reported that they spent learning Canvas and how much time they spent building their course sites in the system.

Breaking down the respondents to the survey by their affiliation, it is clear that the decision to recommend Northwestern move to Canvas is not dependent on field of study.
A similar breakdown of the stay/switch recommendation shows no trend regarding type of class offered. During the pilot, most Canvas sites represented a supplement to traditional face-to-face classes. The fully online classes and those that were a blend of online and face-to-face had instructors who advocated switching to Canvas.
**Time to learn Canvas:**
Cumulative:
- 12% (N=5)  
  About 30 minutes or less
- 29% (N=12)  
  One hour
- 19% (N=8)  
  More than 1 hour, but no more than 2 hours
- 24% (N=10)  
  More than 2 hours, but no more than 4 hours
- 17% (N=7)  
  More than 4 hours

**Time to build a course in Canvas:**
Cumulative:
- 44% (N=19)  
  1-5 hours
- 19% (N=8)  
  5-10 hours
- 19% (N=8)  
  10-15 hours
- 19% (N=8)  
  15+ hours
As we move towards a transition to Canvas, we will be able to tell faculty members that they should budget around 2 hours to learn the system and probably no more than 10 hours to build their first course. One assumes that the learning curve is such that the time to build a second course in the system will be less than the first course.

**Student Surveys**
The surveys of students in the pilot classes also asked whether the university should switch from Blackboard to Canvas. The student response is resounding. In the first quarter of pilots, Fall 2013, 73% of the respondents said the university should switch to Canvas; in the second quarter, 74% said the university should switch to Canvas. Overall, then, with 502 respondents, 74% of the students endorsed a switch to Canvas.

Breaking the stay/switch recommendation down by year at Northwestern and the type of class they were taking revealed no significant patterns. Graduate students, professional students, and Ph.D. students were slightly more likely than undergraduates to recommend staying with Blackboard.
Cumulative response of students to stay/switch recommendation, broken down by year at Northwestern, in percentages. N=499

Cumulative response of students to stay/switch recommendation, broken down by how Canvas was used in their classes: as a supplement to a face-to-face course, as part of a blended course, or a fully online course. Figures are percentages. N=482
We also asked the students how long it took them to learn Canvas. The vast majority reported taking 30 minutes or less to learn the system.

![Cumulative student response to time to learn Canvas estimate. N=513]

To accompany the question about learning Canvas, we asked for student preferences in how students should learn the system. The clear favorite, both quarters, was for an in-class demonstration. All the options, in order of preference, are listed below:

- In-class demonstration
- Online (non-video) tutorials (written text; pictures)
- Online video tutorials
- Printed materials distributed to class
- Online scavenger hunt
- Face-to-face training in a computer lab

Faculty and students agree that the best way to learn Canvas is an introduction in class. This allows students to see how materials are organized in the site and how the faculty member is using the various tools.

![Cumulative faculty and student responses to a question about the best ways for students to learn Canvas. N=44 Faculty, N=503 Students]
When asked for their comments on learning Canvas, many students made comments along the lines of "It's intuitive," or "It's easy – just play with it," or "This was not at all hard to figure out, would take most college students less than 30 minutes to fully figure out without any outside help."

Given these responses, it seems clear that students do not need extensive training in Canvas.

More Faculty reactions to Canvas
Surveys also asked the faculty about their positive and negative assessments of Canvas. Selected comments from NU faculty follow:

What do you like best about Canvas?
- Nice elegant layout with easy communication modes.
- It looks and feels "new". The multimedia functions for a conversation course are awesome.
- Very intuitive, transparent, simple to get started, but has features I have not begun to explore.
- Being able to break my sections into groups and either communicate with them individually or all at once, and using a single gradebook.
- I loved how easy it was to collaborate on group projects using Google Docs. ... The collaborations feature was great! I also really liked how easy it was to create modules and then add assignments, files, etc. to the modules.
- Two outstanding things: 1. The assignment grading function is UNBELIEVABLE! The speedgrader allows for detailed feedback against a built-in rubric. Ironically, despite the improved detail my time spent in providing evaluation was cut exponentially. I liked having the ability to provide audio feedback. 2. Course building/organization capabilities are unparalleled. I used both the calendar function and modules to provide an extensive, yet highly organized course environment. I loved this!!
- Students seem to like the interface. Speedgrader works well - not perfect, but solid.
- Easy to use. I did not have one student have a problem with Canvas - and with Blackboard I feel like even in a small class students [have issues].... It's much more intuitive. And creating an assignment is far less time consuming. I tried Canvas for a course where I don't use a lot of online tools, assignments etc. just so I could get a feel for it. With Blackboard, I avoid the ... higher level functions because they are too cumbersome and students have problems with things like blogging, etc. and I feel like I spend too much time fielding student emails who are having problems. But with Canvas I would definitely try these kinds of things in the future.
- It's better than Blackboard; more user-friendly; it forces very clear deliverables = clarity; I LOVE speedgrader.
- So much more user friendly- easier to navigate, customize- LOVE the calendar feature!

What do you like least about Canvas?
- Can be somewhat clunky when uploading documents.
- It has a lot of different options. I have used CANVAS for a quarter now and feel that I only "scratched the surface" so far. Much more to learn and explore (of course, this could also be a very good point ....)
- The gradebook was a bit weird.
- I do not like how the Syllabus feature automatically populates from items created in the course. I think students have an expectation for what syllabus means and they are confused when they click on Syllabus and don't find the official syllabus for the course.
- The difficulty moving and organizing files. I found the files function very rigid and limited.
The Grade Center is not nearly as robust as Blackboard. Each grade center column in Blackboard enables you to do all kinds of data sorts and statistics/analyses. The grade center in Canvas is very rudimentary in comparison and I had to do a lot of extra work because of it.

Peer review auto-assign option; not yet useful -- it needs more custom settings (e.g. one-to-one correspondence between reviewed and reviewer).

Worst feature was big blue button--adobe connect is much better.

Because there are so many notification settings (and the "email" functionality is called "conversations"), apparently a lot of students turned those notifications off so they were not receiving emails. After I discovered this I told everyone they needed to have conversations set to ASAP, but this could be an issue other instructors have so I would recommend telling your students to have this functionality turned on at the first class meeting. There's a 500MB limit for files stored to the site. I'm guessing blackboard has a limit, too, but we never hit it (and I'm using the same files on both sites). I believe we can request additional space through the university (that's what Instructure told me), but it will be interesting to see what % of current blackboard courses are above this threshold. Perhaps storing the material on canvas is not the way to go--maybe it needs to be stored on a second site and just linked to the course site.

Can't search across threads in discussion group

Can't do surveys with branching

I actually like the customization features better in Blackboard (like changing the site colors, font etc.) But this is not a big issue. I'm not loving the grade book. In Blackboard, it seems to be easier to just add a column because not everything is tied to an assignment - so I've gotten use to having various columns in BB that I use to track students, leave notes for TAs, etc. And I can't figure out how to hide individual grade columns from students. But once the learning curve is over, the Canvas grade book probably is better.

Sometimes it seems there are too many ways to get to one place which can be a bit confusing

Suggestions: 1. Discussions: I should be able to handle discussions entirely through email. A student posts, I get an email, I respond via email, my response is posted on canvas. I should not have to touch canvas to respond. Other systems had this years ago.  2. LaTeX integration. Nice that it exists, but it's poor. If I post a chunk of valid LaTeX, the system should be able to parse it to identify what's text and what's math, and format appropriately, rather than requiring me to manually convert every little bit that's math. 3. Integration with non-LMS features: I activated Piazza, but then found that I had to manually invite students???? This is not integration, this is just providing a link to a separate system. Adding students is easy, but it should not be necessary. An added feature should automatically integrate with student lists in Canvas.  4. Canvas needs better integration with local file systems. WHERE IS WEBDAV????? Webdav was by far the best thing about Blackboard (but not enough to overcome the decrepitude of the rest of the system.)
Appendix B: Members of the Learning Management System Review Group

- **Chair:** Greg Light, Director, Searle Center for Advancing Learning and Teaching.
- Gad Allon, Professor, Managerial Economics and Decision Sciences, Kellogg School of Management
- Stu Baker, Associate University Librarian, Northwestern University Library
- Susanna Calkins, Associate Director, Searle Center for Advancing Learning and Teaching
- Beth Clausen, Department Head, Access Services, Northwestern University Library
- Tom Collinger, Associate Professor, Medill School of Journalism, Media, Integrated Marketing Communications
- Caitlin Frano, Director of Distance Education, School of Continuing Studies
- Vicky Getis, Manager, Faculty Support Services, NUIT Academic & Research Technologies
- Sandy Goldberg, Professor, Philosophy, Weinberg College of Arts and Sciences
- Mike Hannen, Director, Information Technology, School of Education & Social Policy
- Maud Hickey, Associate Professor, Bienen School of Music
- Ian Horswill, Associate Professor, Electrical Engineering and Computer Science, McCormick School of Engineering and Applied Science
- Candy Lee, Professor, Medill School of Journalism
- Stanley Lo, Curriculum Development Specialist, NU Ventures in Biology Education, Weinberg College of Arts and Sciences
- Franziska Lys, Associate Professor, German, Weinberg College of Arts and Sciences
- Sazzad Nasir, Assistant Professor, Communication Sciences and Disorders, School of Communication
- Jeff Merrell, Associate Director, Master’s Program in Learning & Organizational Change, School of Education & Social Policy
- Leslie Oster, Clinical Associate Professor of Law, School of Law
- Taylor Page, Student, The Graduate School
- Bill Parod, Software Architect, NUIT Academic & Research Technologies
- James Rich, Enterprise Architect, Kellogg School of Management
- Chris Riesbeck, Associate Professor, Electrical Engineering and Computer Science, McCormick School of Engineering and Applied Science
- Bob Taylor, Senior Director, NUIT Academic & Research Technologies.
- Matt Taylor, IT Director, Multimedia Learning Center, Weinberg College of Arts and Sciences
- Emerson Tiller, Professor of Law and Business, School of Law.
- Harlan Wallach, Digital Media Architect Lead, NUIT Academic & Research Technologies
- Administrative Support – Jen Koh, Project Manager, NUIT Academic & Research Technologies
- Administrative Support – Les James, Project Management Specialist Sr., NUIT Academic & Research Technologies

* Indicates a member of the Steering Committee for the LMS Review Group