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Implementing a new cloud-based Learning Management System (LMS):

Rationale, Evaluation and Change Management

Lee Chye Seng
Director-Learning Systems and Applications
14 Jun 2016

Agenda

1. Rationale for Change
2. LMS Evaluation
3. Change Management
4. Cloud Security
5. Q & A

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About SIM University

www.unisim.edu.sg

Established in 2005, Singapore's only privately-funded university dedicated to adult learners

The School of BUSINESS

The School of SCIENCE & TECHNOLOGY

The School of LAW

The School of HUMAN DEVELOPMENT & SOCIAL SERVICES

The School of ARTS & SOCIAL SCIENCES

UniSIM College

Programmes	> 50
Student Enrolment	> 13,600
Alumni	> 26,500
Full-time Faculty	> 110
Associate Faculty	> 900
Full-time Non-academic Staff	> 260

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Rationale for Change

1. Need for a highly resilient and future-ready LMS

2. Emerging LMS platforms in the market

3. Recent experience of cloud-based LMS

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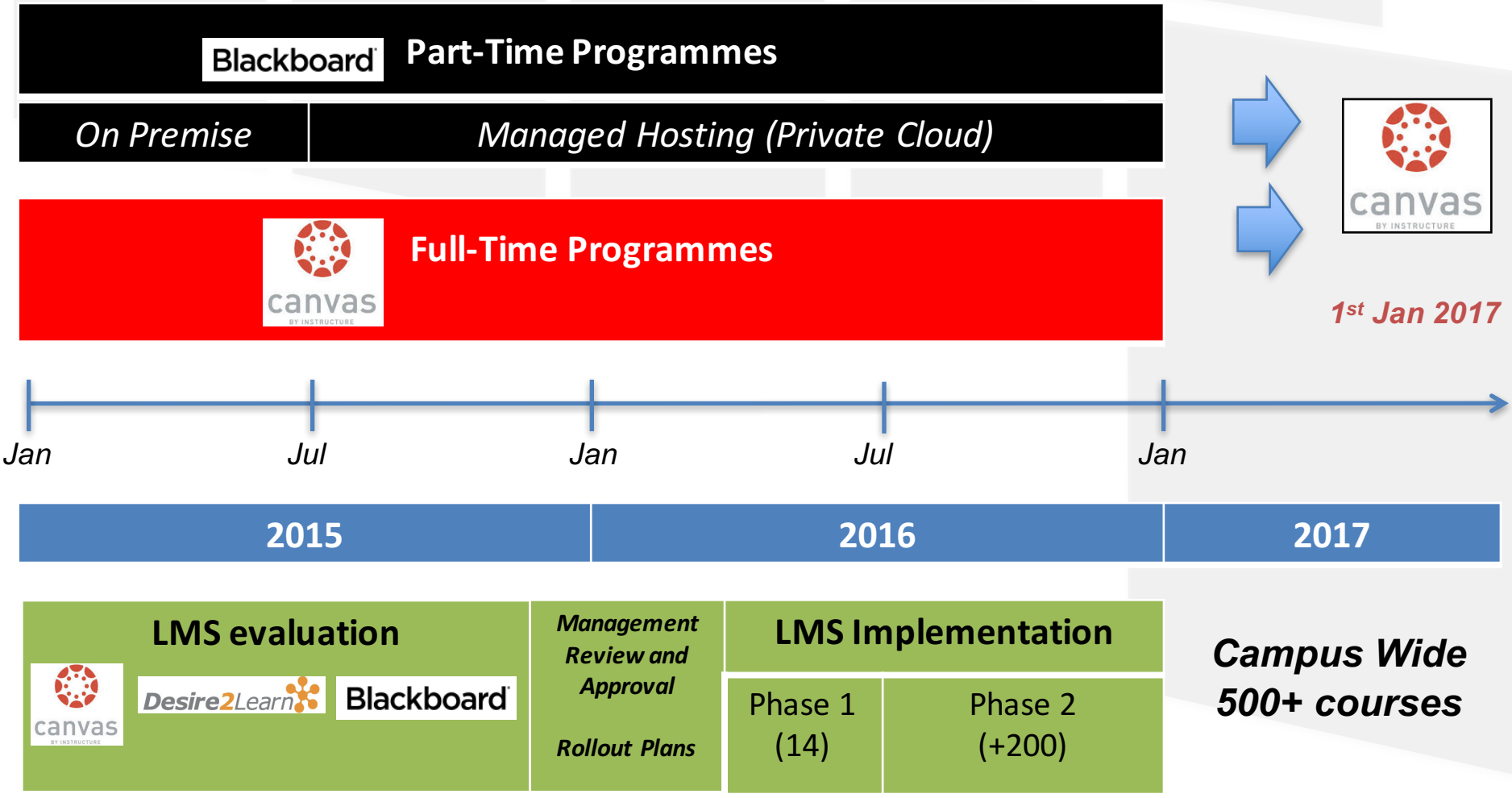
Project Timeline



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Next Generation Digital Learning Environment (NGDLE)

Why IT Matters to Higher Education
EDUCAUSEreview

VISIT EDUCAUSE ›

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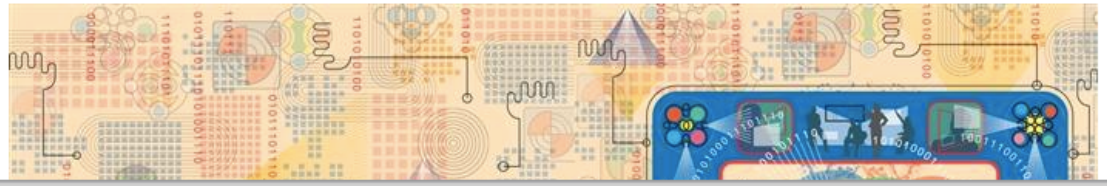
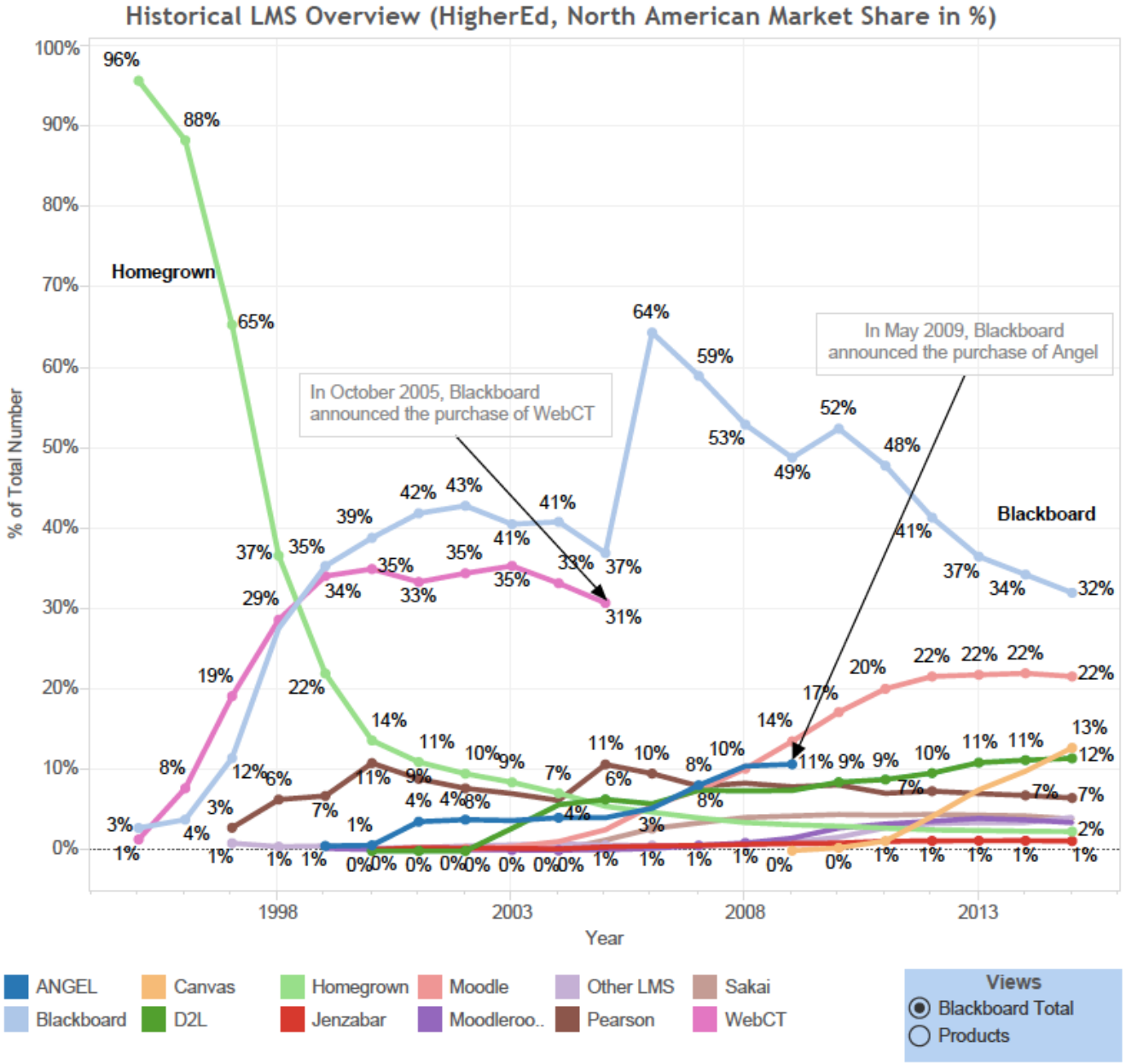
5 key considerations:

1. *Interoperability and Integration*
2. *Personalisation*
3. *Analytics, Advising and Learning Assessment*
4. *Collaboration*
5. *Accessibility and Universal Design*



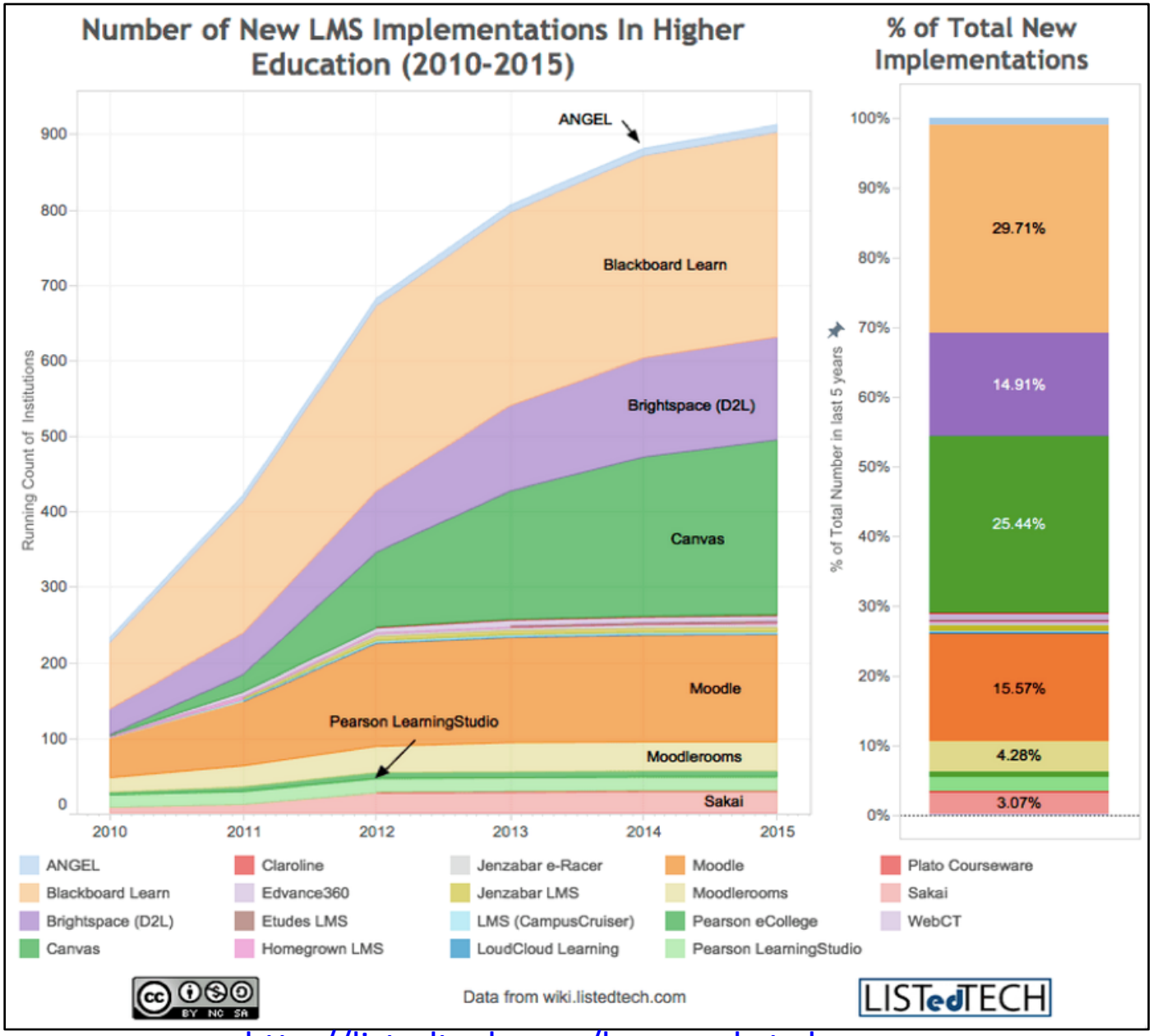
http://er.educause.edu/articles/2015/6/whats-next-for-the-lms

LMS Market Share



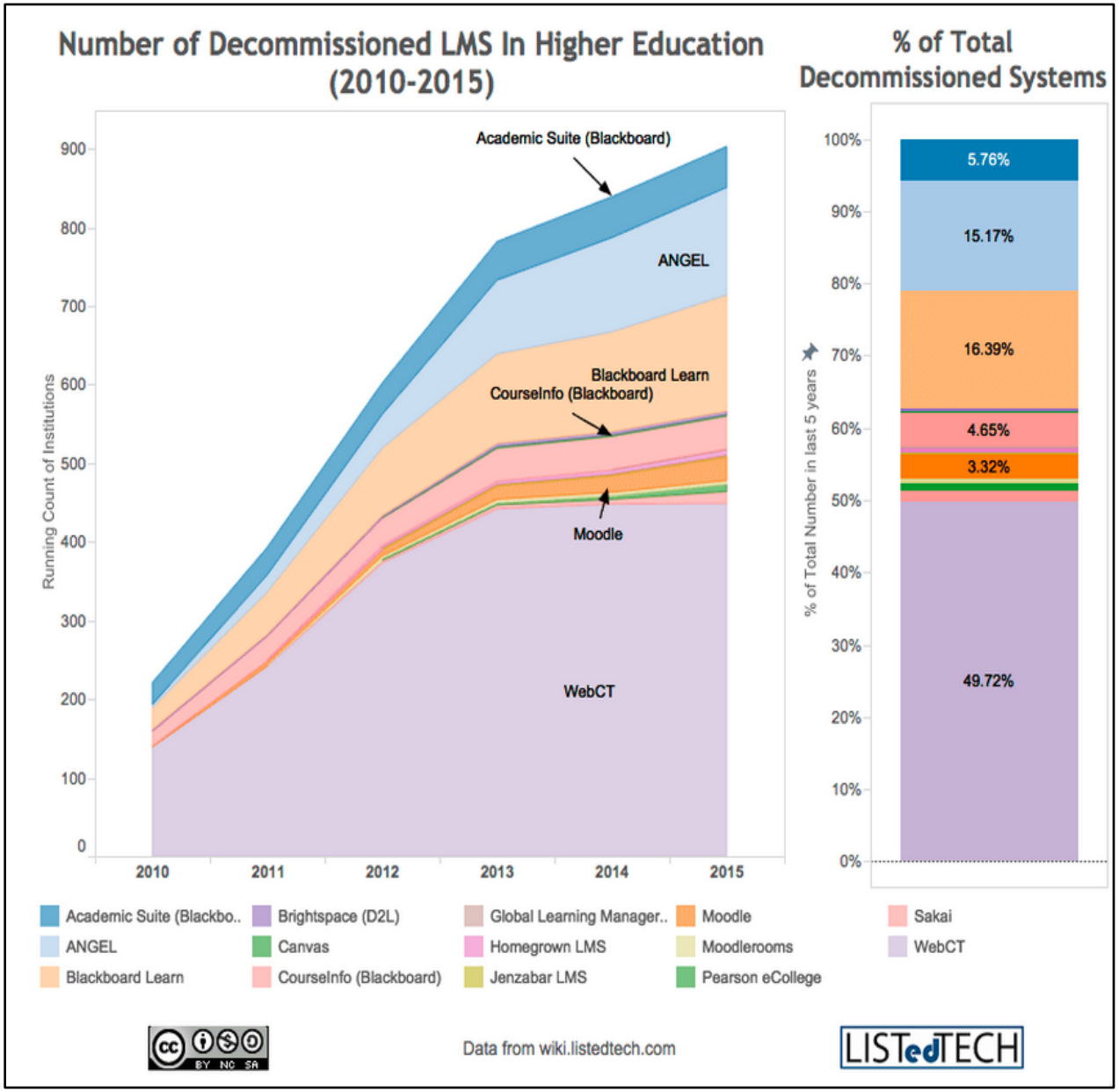
http://listedtech.com/historical-lms-overview/?utm_source=LISTedTECH&utm_campaign=bde00831d7-12_8_2015&utm_medium=email&utm_term=0_cfae303a79-bde00831d7-99256765

New LMS Installations



http://listedtech.com/lms-market-share

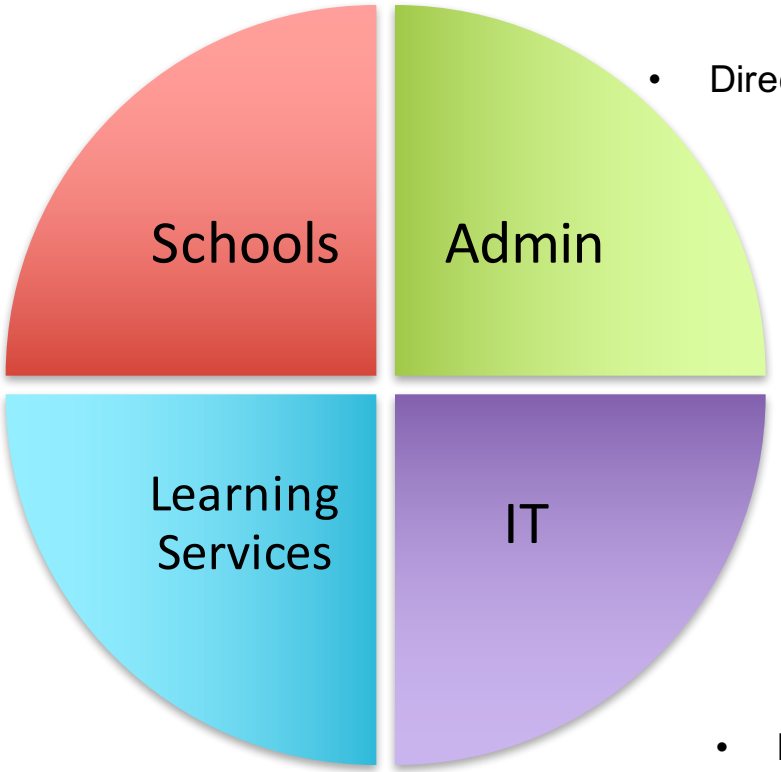
Decommissioned LMS



http://listedtech.com/lms-market-share

LMS Task Force (14 members)

- Vice Deans
- Heads of Programme
- Faculty Representatives



- Director, Office of Academic Services

- VP, Learning Services
- Director, Learning Systems and Applications
- Director, Educational Technology and Production
- Director, Teaching and Learning Centre

- Director, Campus IT Services

Evaluation Criteria

- **Technical**
  - System Reliability
  - LMS Customisations
  - Core eLearning Tools
  - Vendor Support
  - Integration with external systems
- **Teaching and Learning**
  - User Interface and Ease of Use
  - Mobile Learning
  - Social Learning
  - Outcomes Assessment
  - Learning Analytics
  - Personalisation

Evaluation Process

Set up test LMS instance

Face-to-Face Training

Vendor Presentation

Hands-On and Guided Evaluation with To-Do Check-list

Survey

canvas	Feb - Mar 2015
Desire2Learn	Apr - May 2015
Blackboard	Jun - Jul 2015

- LMS task force, 130 UniSIM scholars and 6 former students conducted hands-on evaluation
- Invited existing Canvas (550) and D2L (4,000) users from SIM entities to join in the surveys

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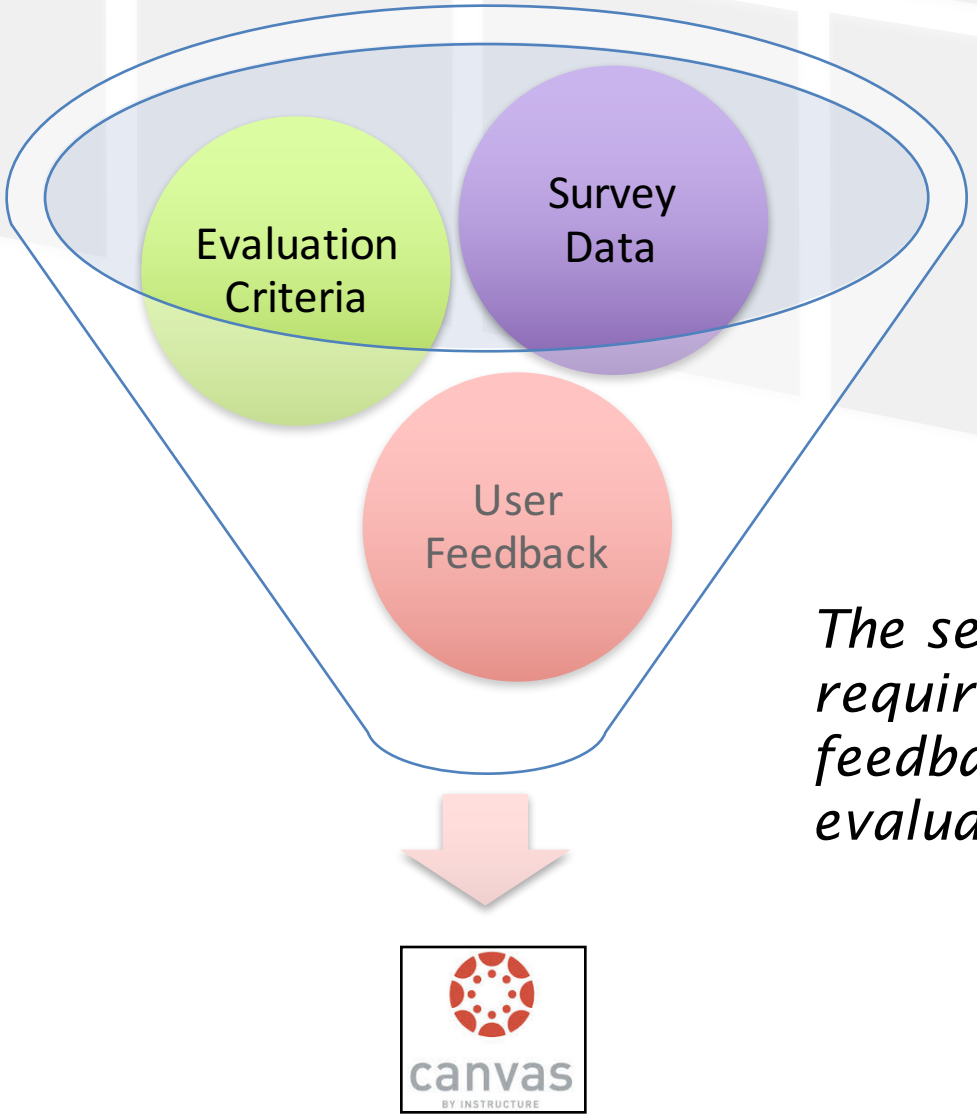
Survey Questions

No	Question
1	The LMS's user interface is simple, intuitive and easy to navigate.
2	The LMS has all the essential functions (i.e. documents upload, quiz, discussion forum, assignment submission, etc) that I need for teaching. The LMS is easy for me to carry out my learning tasks (e.g. download materials, attempt on-line quiz, participate in discussion forums, submit assignments, etc).
3	The LMS mobile app is useful.
4	The response time of the LMS is satisfactory.
5	The LMS has been stable and I have not encountered much technical difficulty.
6	My overall experience with the LMS has been good.
7	If you have any comment and suggestion that can enhance your experience of the LMS, please specify here.

Survey Questions

No	Question
8	Comparing with the LMS that you have used before, please indicate whether this LMS performs better or worse in the terms of the following: a. User Interface b. Ease of Use c. Usefulness of LMS features (e.g. content upload/download, quiz, discussion forum, assignment submission, etc) d. Support for mobile devices e. System response time f. System stability

Selection Process



The selected LMS met our key requirements with positive feedback from the users and evaluators

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Canvas LMS Implementation Plans

1 Year

14 courses

Mar 2016

Phase 1

Jul 2016

Phase 2

200 courses

300 courses

Jan 2017

Campus Wide

- Canvas LMS Transition Team

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Awareness Drive

Lift Display

!nSync
September 2015
A UniSIM Staff Newsletter

SIM UNIVERSITY

In Sync (April 2016) – Happenings

New Learning Management System – Canvas

All UniSIM faculty and students will be embracing a modern-looking Learning Management System (LMS), Canvas, come January 2017. After a year of hands-on evaluations, from January to December 2015, to identify a future ready and forward-looking LMS that will meet our teaching and learning needs in the years ahead, UniSIM has decided to replace our incumbent Blackboard LMS with Canvas.

Canvas has better matched our key teaching and learning requirements in the areas of ease of use, mobile learning, social earning, outcomes assessment, learning analytics and learning personalisation. It is not new to UniSIM as UC has been using Canvas for close to two years with positive vibes.

As part of the migration plans in ensuring everybody is equipped with the necessary know-how on Canvas, LSA has lined up a series of briefings that will cover a broad overview of Canvas features and hands-on workshops to provide an opportunity for faculty and students to walk through step-by-step the typical usage scenarios. As of April 6, a total of 499 students, and 127 associates, faculty and school admins had attended one of these sessions. Click here to register for a session if you have not done so already.

Participants attending a Canvas hands-on workshop.

Newsletter

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Awareness Drive

learningservices.unisim.edu.sg/lms-switch.html

Bookmarks | UniSIM | Heartbeat | Canvas | Apple | iCloud | Facebook | Twitter | Wikipedia | Yahoo! | News | Popular | Microsoft Office Onl | Imported From Safari

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LEARNING MANAGEMENT SYSTEM SWITCH

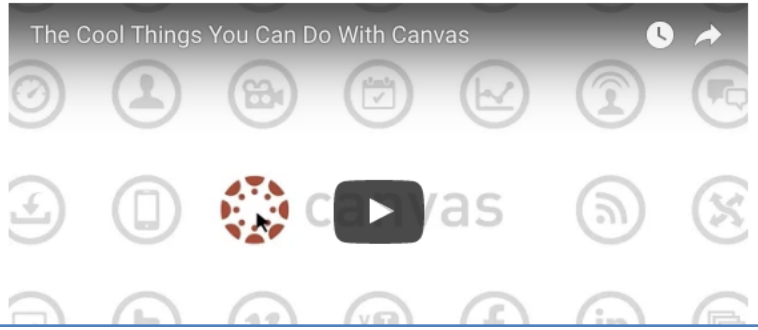
MOVE OVER BLACKBOARD, TAKE YOUR PLACE CANVAS

THE CHANGE

All UniSIM faculty and students will be embracing a modern-looking Learning Management System (LMS) come Jan 2017, following a LMS evaluation task force's selection of Canvas LMS (http://canvaslms.com) as the successor to our incumbent (Blackboard) which has been in use since 2006.

The choice came about in Dec 2015 after 12 months of hands-on evaluation by the task force with selected groups of students and faculty. Three LMS platforms, namely Canvas, Desire2Learn and Blackboard, were considered. Canvas has better matched our key teaching and learning requirements in the areas of ease of use, mobile learning, social learning, outcomes assessment, learning analytics and learning personalisation.

On the ground, Canvas is not new to UniSIM as UniSIM College (UC) faculty and students have been using this LMS over the past 1.5 years. UC started off with a 6 months pilot of Canvas in



LMS Switch Webpage
http://learningservices.unisim.edu.sg/lms-switch.html

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User Training

Students

June 2016

Canvas Briefing
4 Jun (Sat): 10am to 12pm

Canvas Hands-On Workshop
18 Jun (Sat): 10am to 12pm

Aug 2016

Canvas Workshop
6 Aug (Sat): 10am to 12pm

Sep 2016

Canvas Workshop
3 Sep (Sat): 10am to 12pm

Oct 2016

Canvas Workshop
1 Oct (Sat): 10am to 12pm

Nov 2016

Canvas Workshop
5 Nov (Sat): 10am to 12pm

Dec 2016

Canvas Workshop
3 Dec (Sat): 10am to 12pm

Faculty and School Admin

June 2016

Canvas Briefing
1 Jun (Wed): 3pm to 5pm

Canvas Hands-On Workshop
15 Jun (Wed): 10am to 12pm

Canvas Briefing
8 Jun (Wed): 3pm to 5pm

Canvas Hands-On Workshop
22 Jun (Wed): 10am to 12pm

Jul 2016

Canvas Workshop
13 Jul (Wed): 10am to 12pm

Canvas Workshop
13 Jul (Wed): 7pm to 9pm

Aug 2016

Canvas Workshop
17 Aug (Wed): 10am to 12pm

Canvas Workshop
17 Aug (Wed): 7pm to 9pm

Sep 2016

Canvas Workshop
21 Sep (Wed): 10am to 12pm

Canvas Workshop
21 Sep (Wed): 7pm to 9pm

Oct 2016

Canvas Workshop
19 Oct (Wed): 10am to 12pm

Canvas Workshop
19 Oct (Wed): 7pm to 9pm

Nov 2016

Canvas Workshop
16 Nov (Wed): 10am to 12pm

Canvas Workshop
16 Nov (Wed): 7pm to 9pm

Dec 2016

Canvas Workshop
14 Dec (Wed): 10am to 12pm

Canvas Workshop
14 Dec (Wed): 7pm to 9pm

Canvas Training Schedule

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User Training

learningservices.unisim.edu.sg/preview_testing/user-guides.html

Bookmarks | UniSIM | Heartbeat | Canvas | Apple | iCloud | Facebook | Twitter | Wikipedia | Yahoo! | News | Popular | Microsoft Office Onl | Imported Fron

SIM UNIVERSITY — Learning Services Cluster

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User Guides

Home / Help / User Guides (Full Time Student)

- Helpdesk Info
- User Guides
  - User Guides (Full Time Student)
  - User Guides (Part Time Student)
  - User Guides (Associate)
  - User Guides (School Programme Executive)
- System Status
- Frequently Asked Questions (FAQ)

Canvas Guide

Please click HERE to access the Canvas Student User Guide.
Please click HERE to learn the steps on how to submit your ECA Video on Canvas.

eTextbook Guide

Please click HERE to access the eTextbooks Guide.

iStudyGuide (iSG) Guide

Please click HERE to access the iStudyGuide User Guide.

MyMail Guide

Please click HERE to access the MyMail Guide.
Please click HERE to access the MyMail Forwarding Guide.

Online User Guides

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User Training

https://canvas.unisim.edu.sg/courses/544

Apps Bookmarks UniSIM Heartbeat Canvas Apple iCloud Facebook Twitter Wikipedia Yahoo! News Popular Microsoft Office Onli Imported From Safari

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Courses & Groups Grades Calendar Commons

LEE Chye Seng Inbox 20 Settings Logout Help

LSA101

2016_JAN_T2_PT_6

Announcements
Home
People
Syllabus
iBookstore
Modules
Quizzes
Grades
Virtual Class
Classroom Recordings
Past Year Exam Papers
Collaborations
Discussions
Outcomes
Conferences
Assignments
Pages
Files
Browse NBC Learn
UniSIM Gradebook
Marked Assignments
SCORM
Settings

LSA101 > Modules

View Progress + Module

Canvas Environment

- Technical Requirements for using Canvas
- Login to Canvas
- Canvas Environment
- Locate your Courses
- View ALL Grades
- Calendar (View Assessments & Events)
- Updating User Profile
- Inbox
- Help

Course Site Environment

- Announcements

Import from Commons
Choose Home Page
View Course Stream
Course Setup Checklist
New Announcement
View Course Analytics

Coming Up View Calendar

Nothing for the next week

Canvas 101 Course Site

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User Training

CTS_CSLEE

Account
Admin
Dashboard
Courses
Groups
Calendar
Inbox 15

Test Site Term

Home
Announcements
Assignments
Discussions
Grades
People
Pages
Files
Syllabus
Outcomes
Quizzes
Modules
Conferences
Collaborations
LockDown Browser
Past Year Exam Papers
Attendance Marking

THIS COURSE IS UNPUBLISHED
Only Teachers Can See This Course Until It Is Published

Need help setting up your course?

Setup Checklist

Recent Activity in CTS_CSLEE

No Recent Messages You don't have any messages to show in your stream yet. Once you begin participating in your courses you'll see this stream fill up with messages from discussions, grading updates, private messages between you and other users, etc.

Course Status

Unpublished | Publish

Choose Home Page

Course Setup Checklist

New Announcement

Coming Up — View Calendar

Nothing for the next week

Canvas Sandbox for Instructors

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Challenges and Issues

1. Existing LMS customisations
2. Interoperability of External Tools
3. Student Information System Data Transfer
4. Single-Sign-On (SSO) from internal portals
5. Course Migration
6. System Troubleshooting
7. The CHANGE itself

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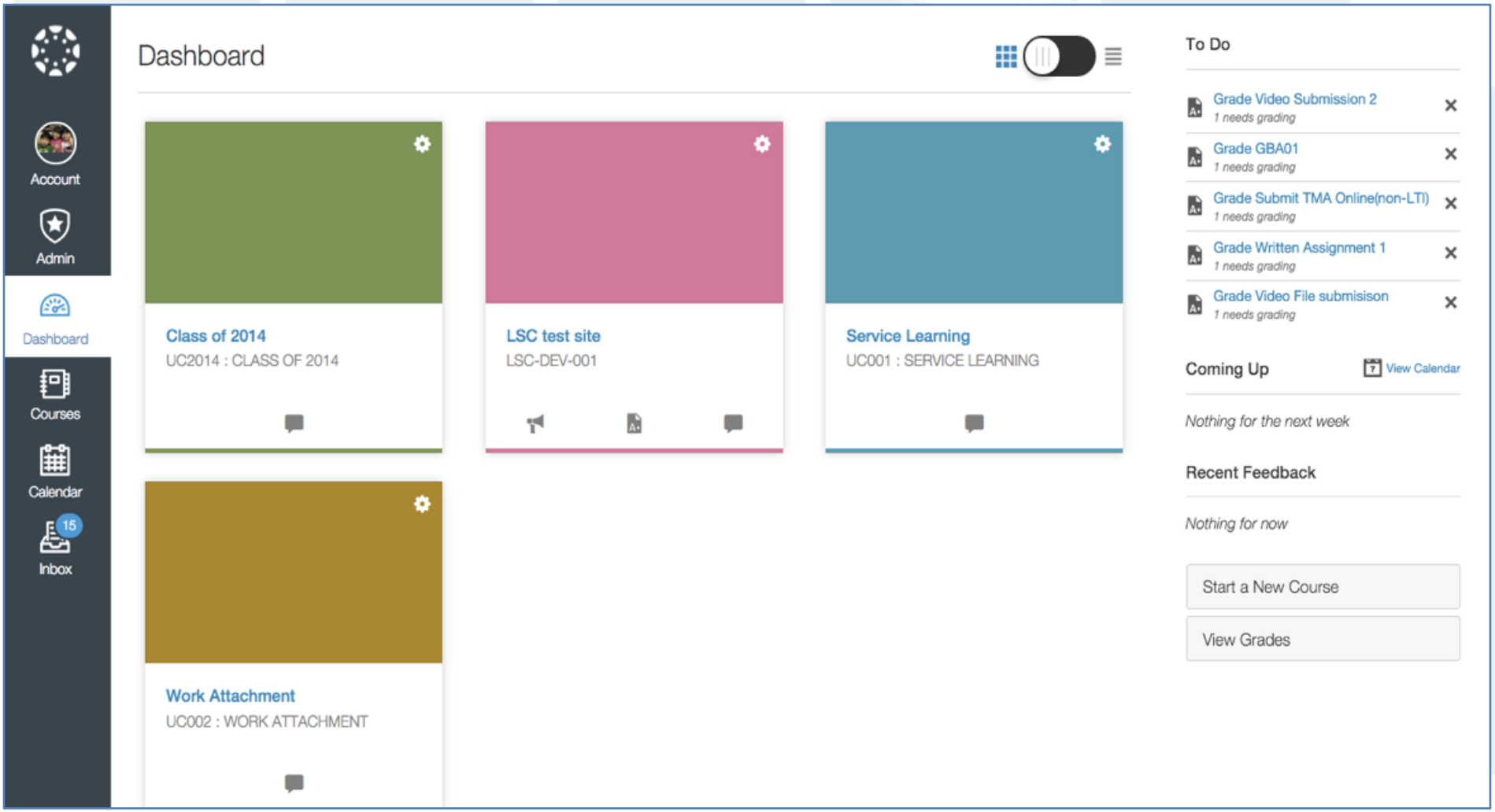
User Interface and Ease of Use



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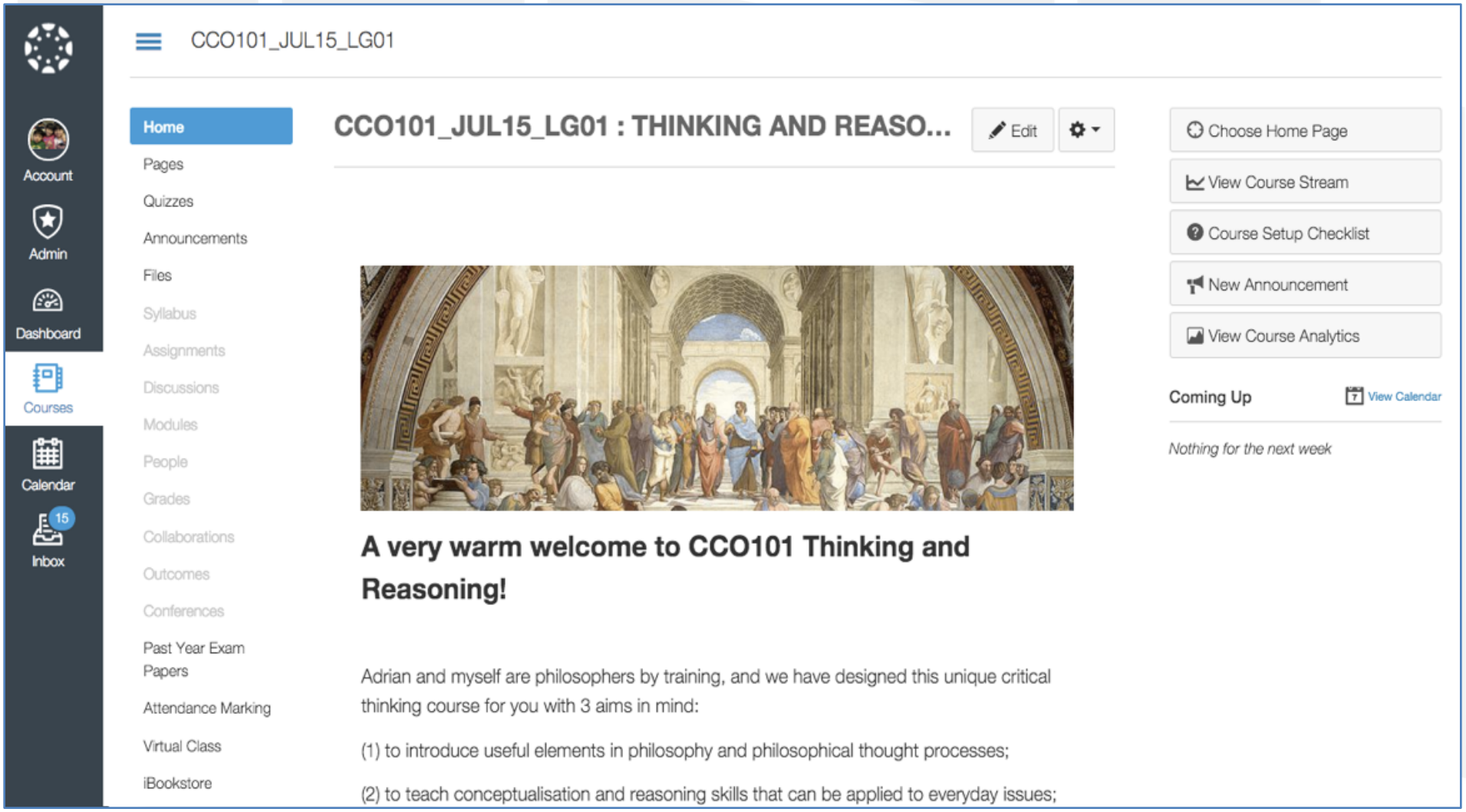
User Interface and Ease of Use



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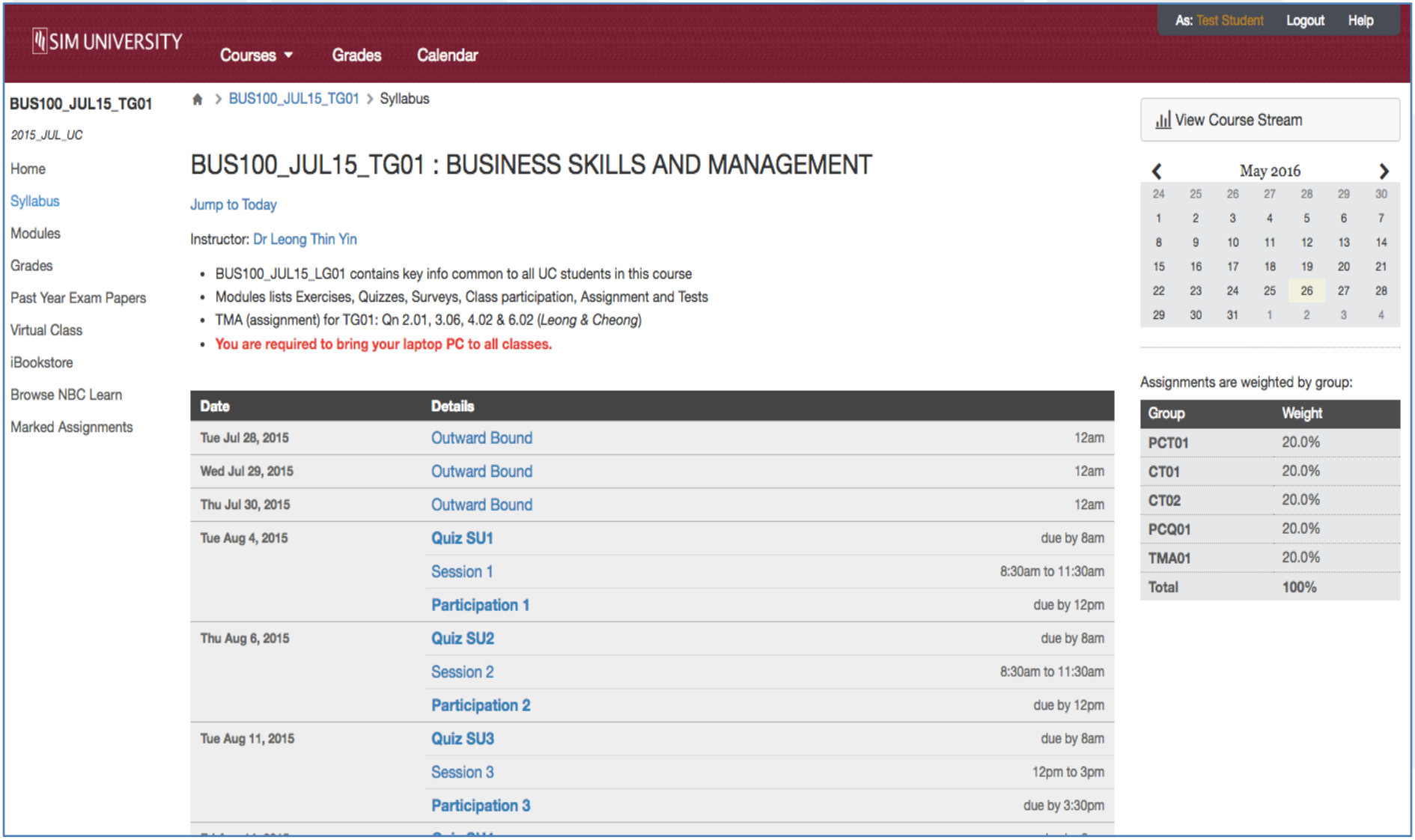
User Interface and Ease of Use



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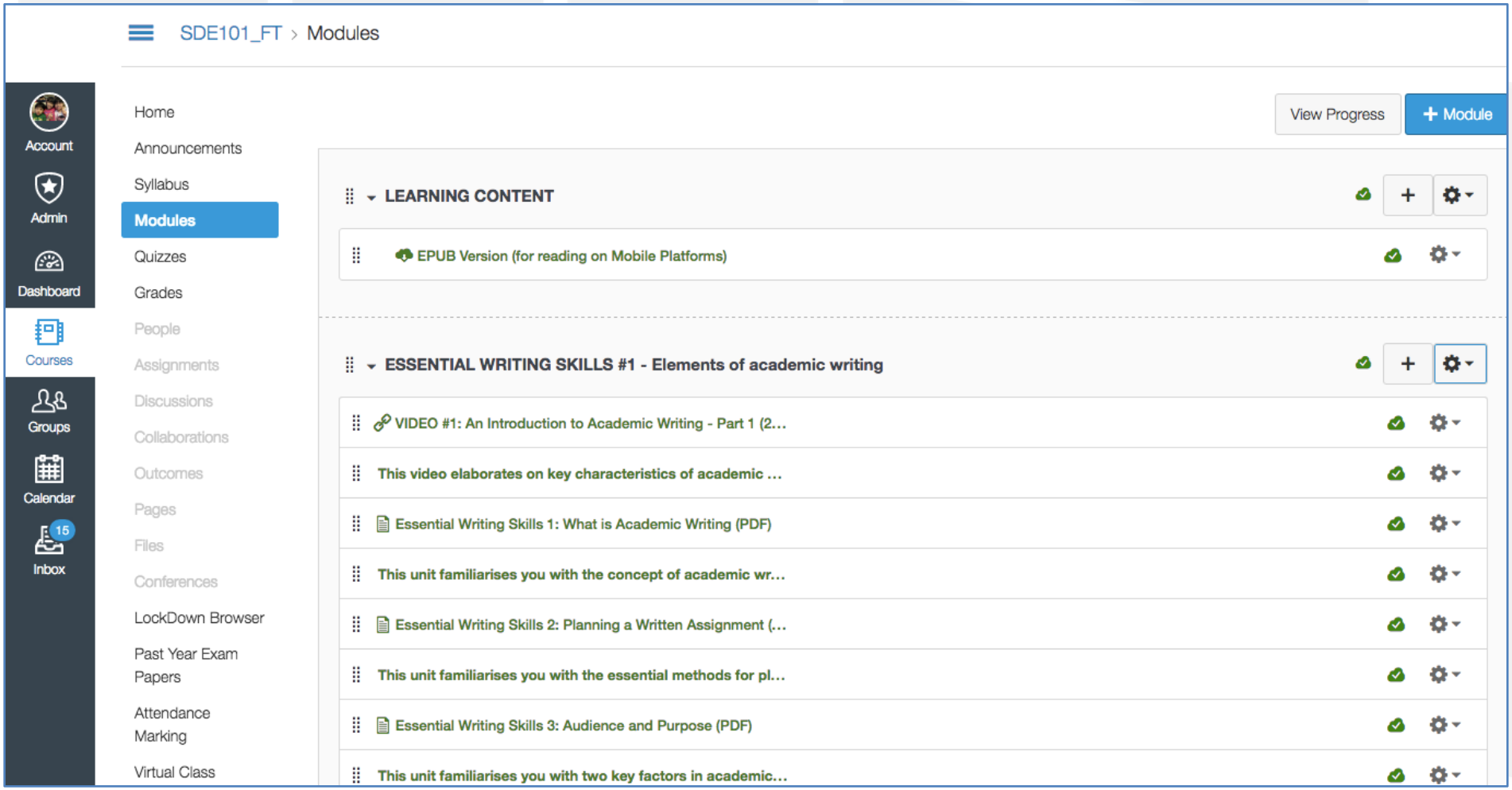
Learning Sequences and Progress



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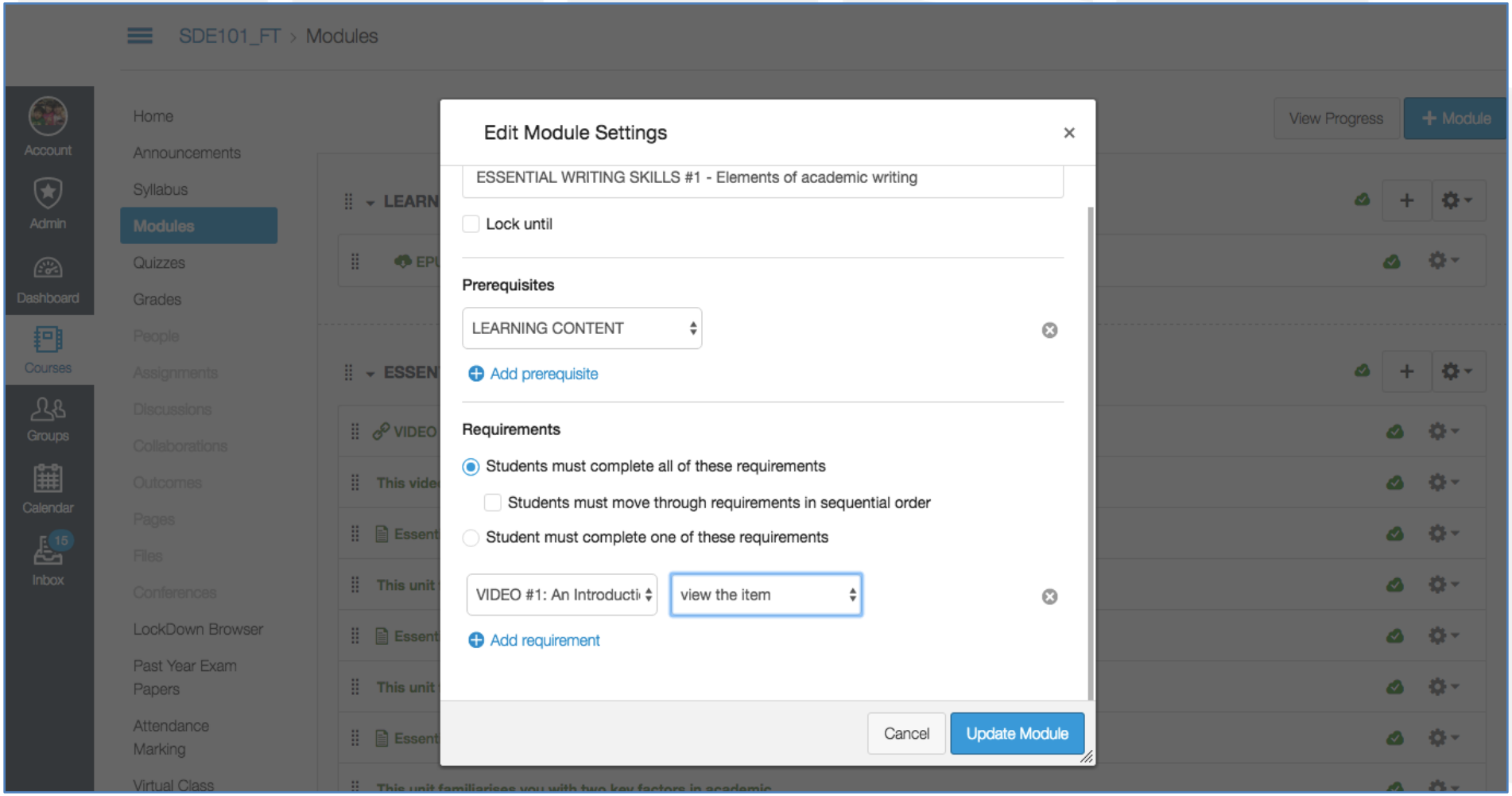
Learning Sequences and Progress



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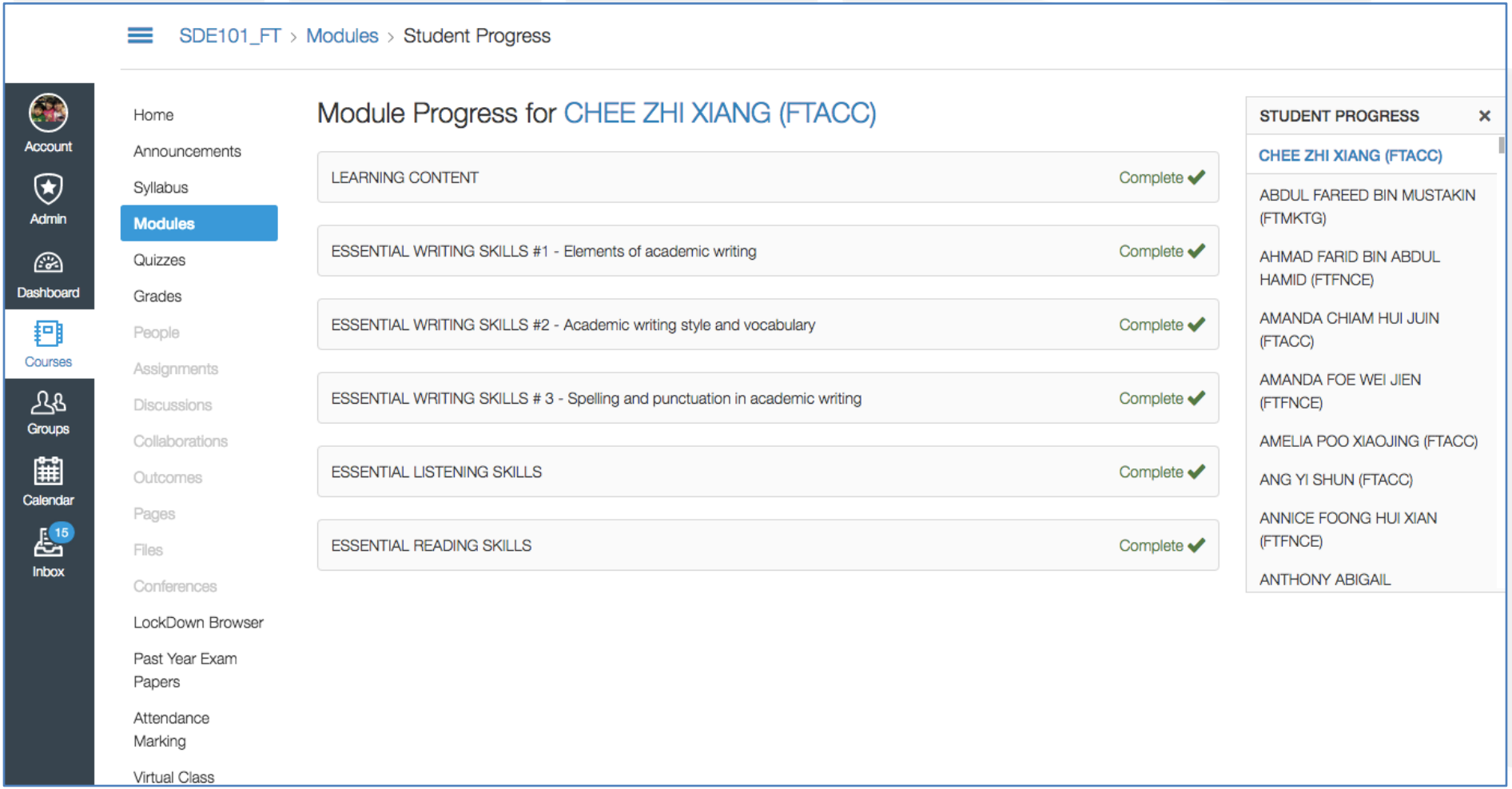
Learning Sequences and Progress



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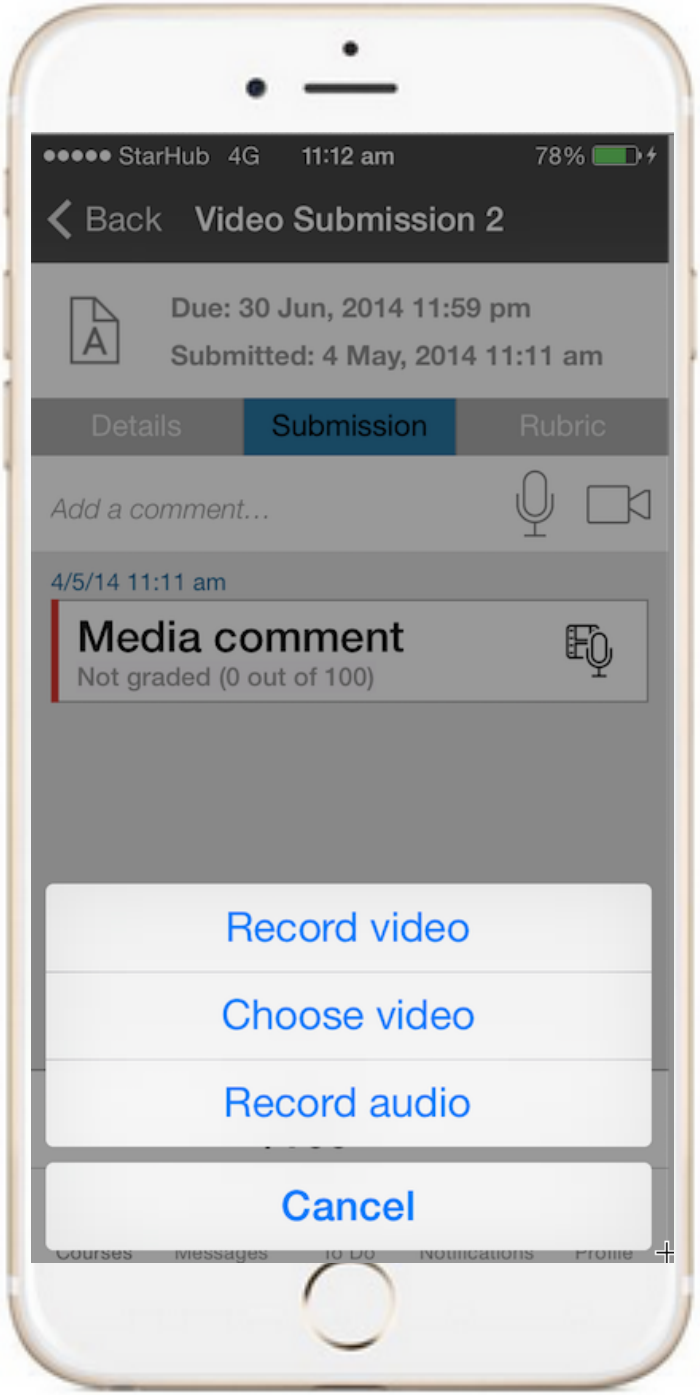
Assignment Submission

LSA Student 06 | Student 1 of 1 | Gradebook Course Home

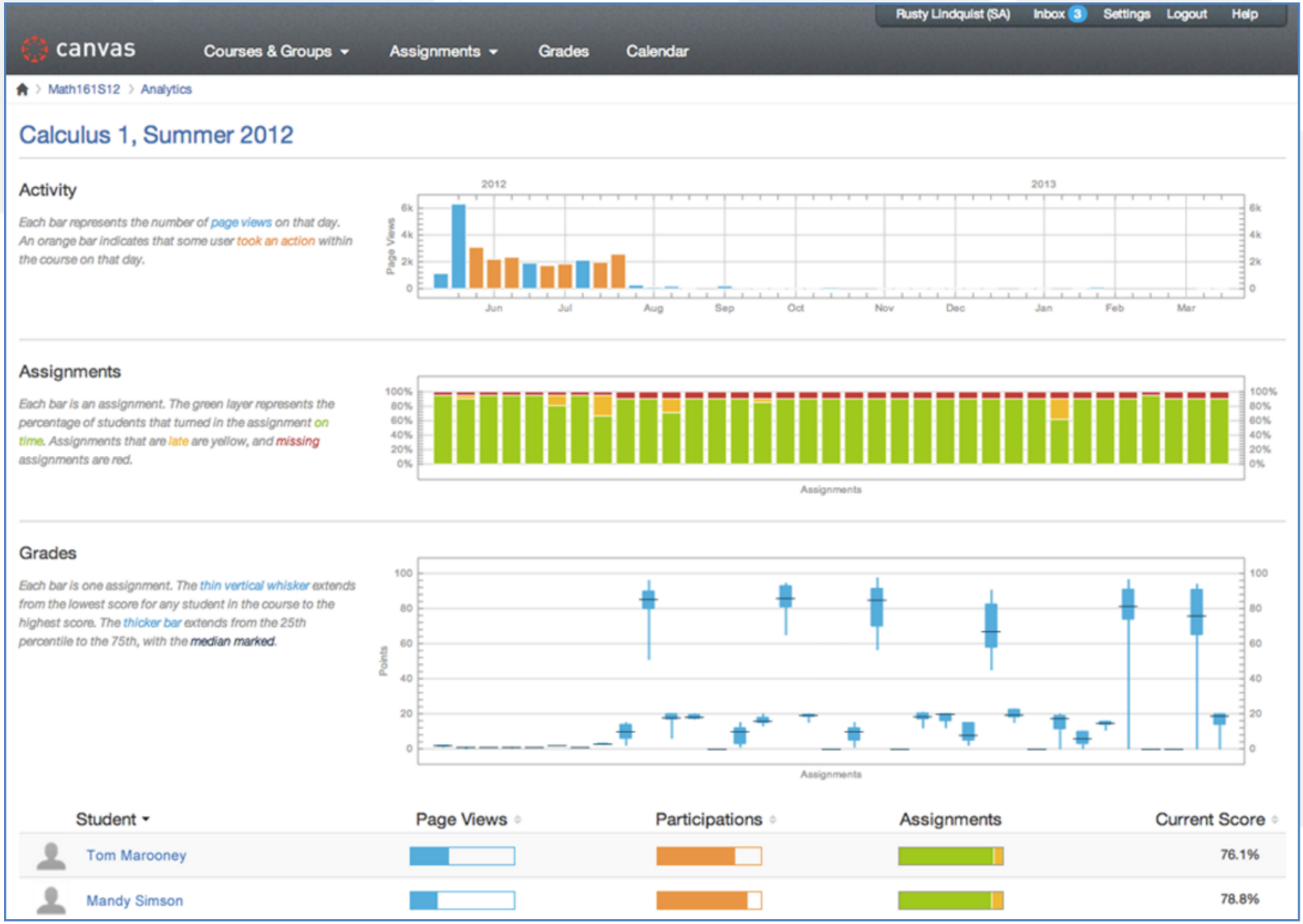
This submission is a media recording.

community and can be applied universally. It is universal in the sense that the system of moral duties is not based on culture or religion but on human nature itself. The concepts of good, bad or evil are evidently shown in *King Oedipus* as they do in the moral systems of other people and cultures.

Sophocles' play presents a political aspect in which Oedipus portrays the protagonist and exercises power as a ruler of Thebes after solving Sphinx's riddle. The characters in Greek setting have to possess great power such as being in a royalty family, or children of Gods in order to be the subject of the play. Oedipus addresses the people of Thebes "My Children" which conveys his sense of control of people under him as well as referring himself as "I, Oedipus, whose name is known afar" which suggests that he is aware of his power and reputation. Besides, the Thebans seek help from Oedipus to "restore our city to life" due to a plague that causes death of the citizens and referred him as "O greatest of men". All of which is a form of a political system involving members in power of the country who make decisions for the society and for a society to be orderly, people must abide the rules and



Learning Analytics



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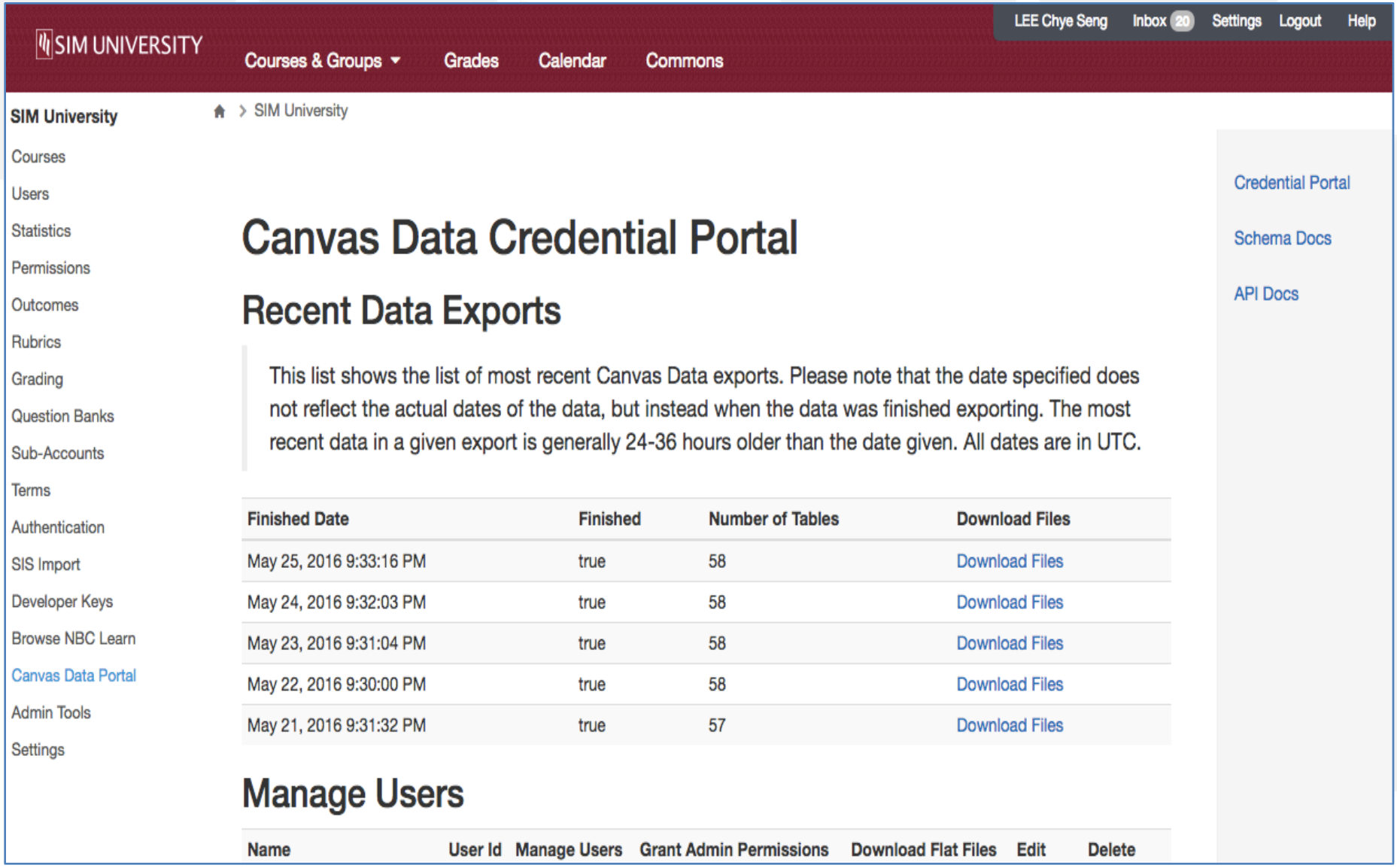
Learning Analytics



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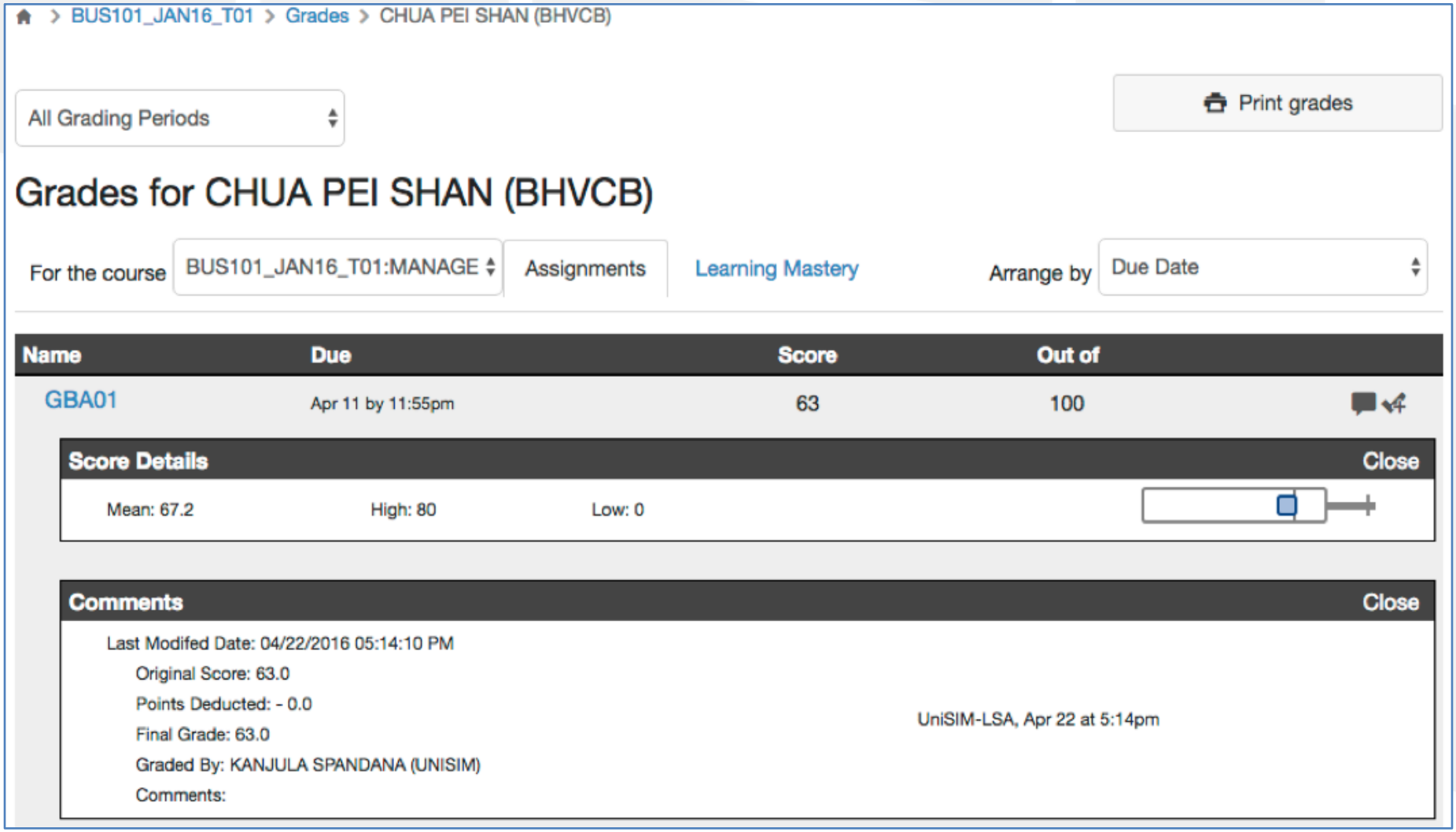
Grade Distribution



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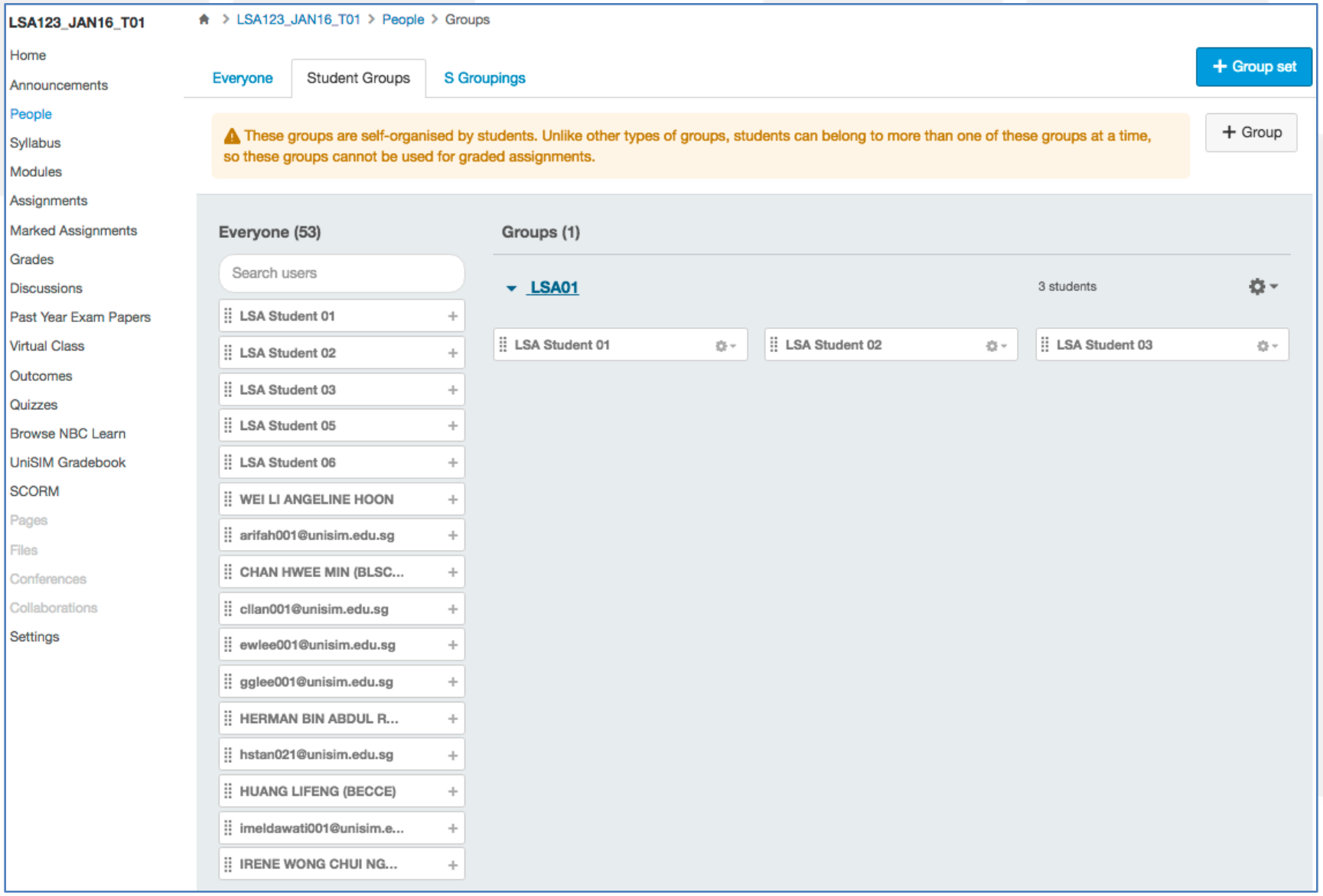
Student Collaboration



Student Group Course Site

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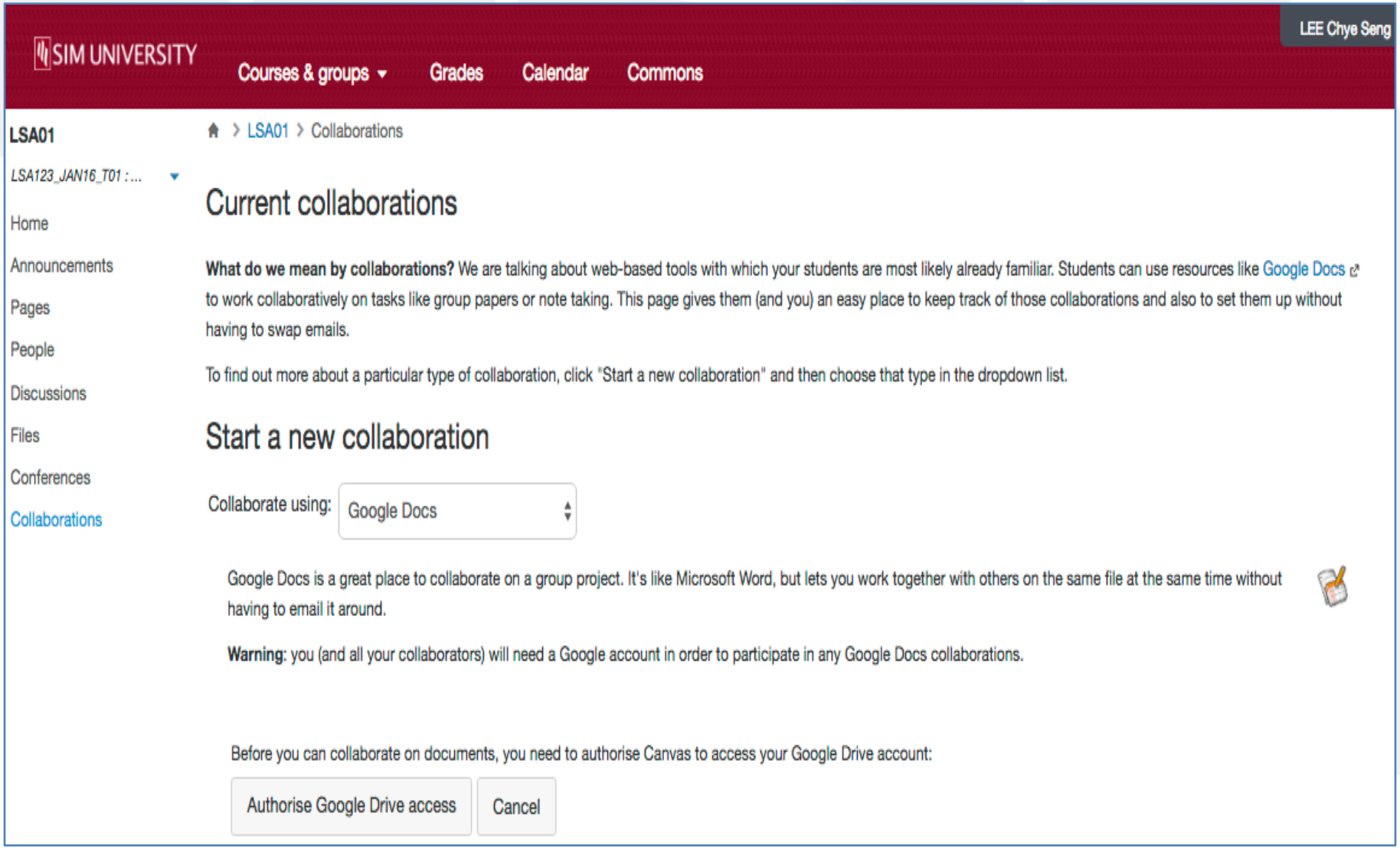
Student Collaboration



Student Group Course Site

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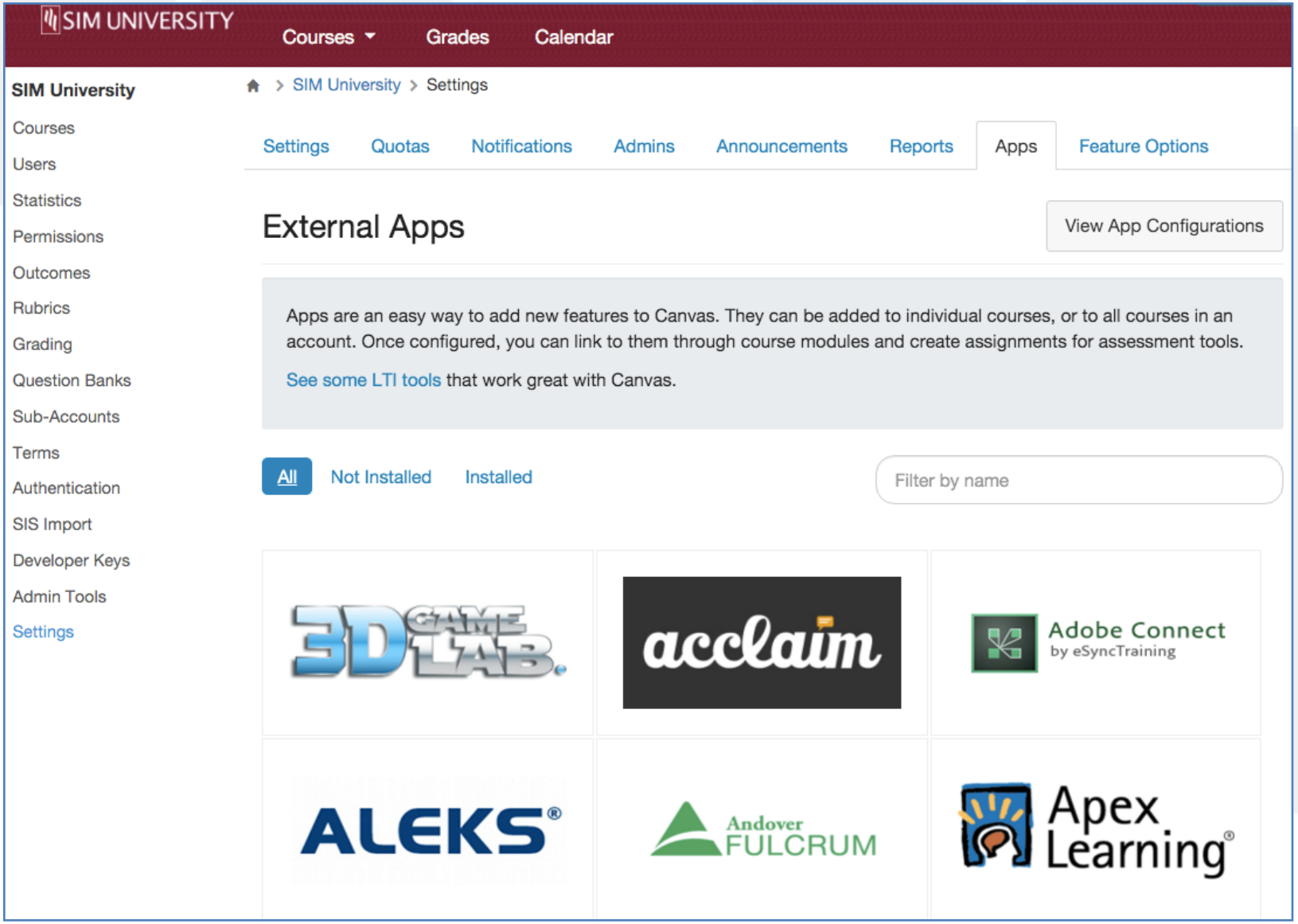
Integration with External Systems



http://www.eduappcenter.com

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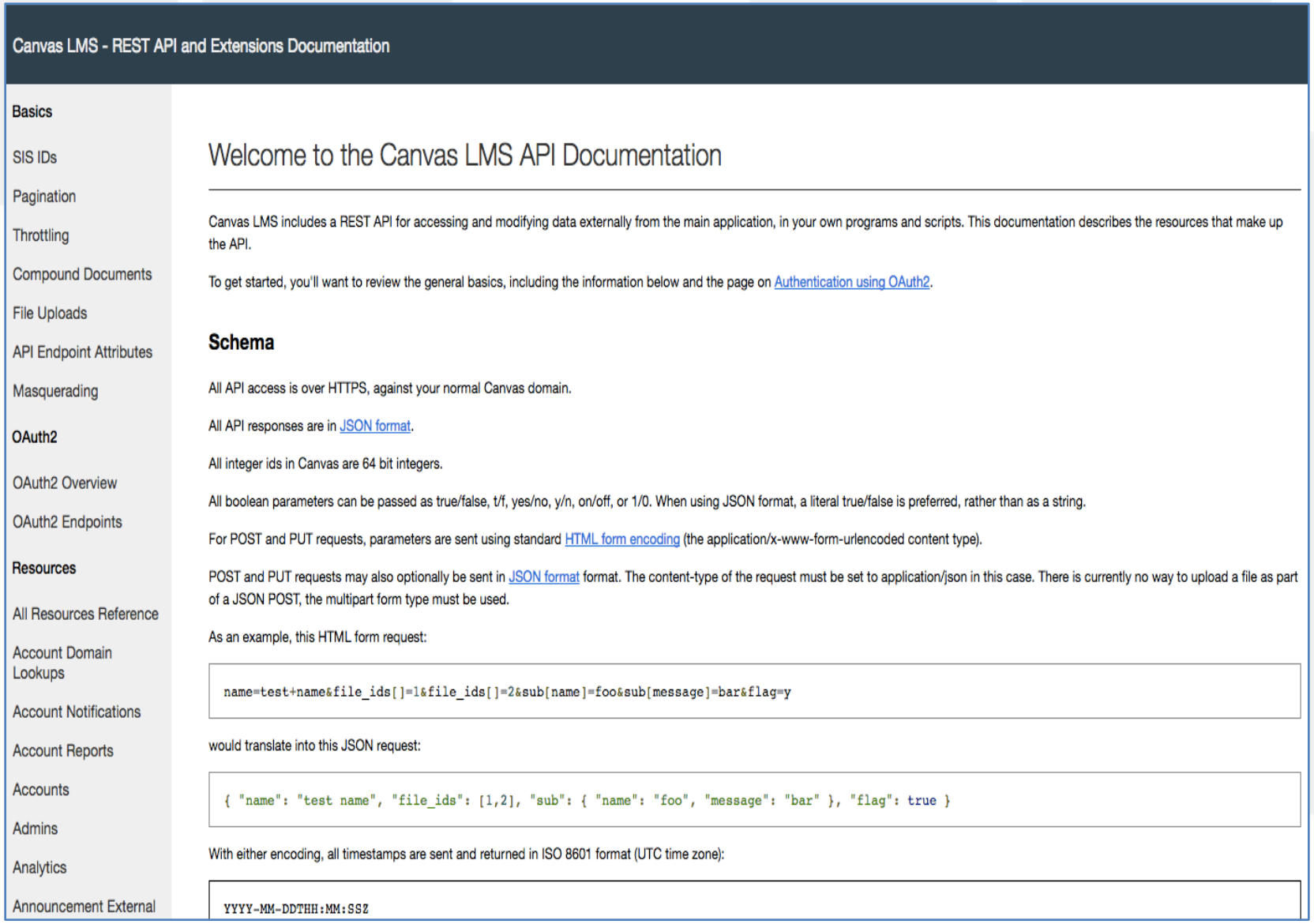
Integration with External Systems



Canvas LMS - REST API and Extensions Documentation

Basics

- SIS IDs
- Pagination
- Throttling
- Compound Documents
- File Uploads
- API Endpoint Attributes
- Masquerading

OAuth2

- OAuth2 Overview
- OAuth2 Endpoints

Resources

- All Resources Reference
- Account Domain Lookups
- Account Notifications
- Account Reports
- Accounts
- Admins
- Analytics
- Announcement External

Welcome to the Canvas LMS API Documentation

Canvas LMS includes a REST API for accessing and modifying data externally from the main application, in your own programs and scripts. This documentation describes the resources that make up the API.

To get started, you'll want to review the general basics, including the information below and the page on Authentication using OAuth2.

Schema

All API access is over HTTPS, against your normal Canvas domain.

All API responses are in JSON format.

All integer ids in Canvas are 64 bit integers.

All boolean parameters can be passed as true/false, t/f, yes/no, y/n, on/off, or 1/0. When using JSON format, a literal true/false is preferred, rather than as a string.

For POST and PUT requests, parameters are sent using standard HTML form encoding (the application/x-www-form-urlencoded content type).

POST and PUT requests may also optionally be sent in JSON format format. The content-type of the request must be set to application/json in this case. There is currently no way to upload a file as part of a JSON POST, the multipart form type must be used.

As an example, this HTML form request:

```
name=test+name&file_ids[]=1&file_ids[]=2&sub[name]=foo&sub[message]=bar&flag=y
```

would translate into this JSON request:

```
{ "name": "test name", "file_ids": [1,2], "sub": { "name": "foo", "message": "bar" }, "flag": true }
```

With either encoding, all timestamps are sent and returned in ISO 8601 format (UTC time zone):

```
YYYY-MM-DDTHH:MM:SSZ
```

http://api.instructure.com

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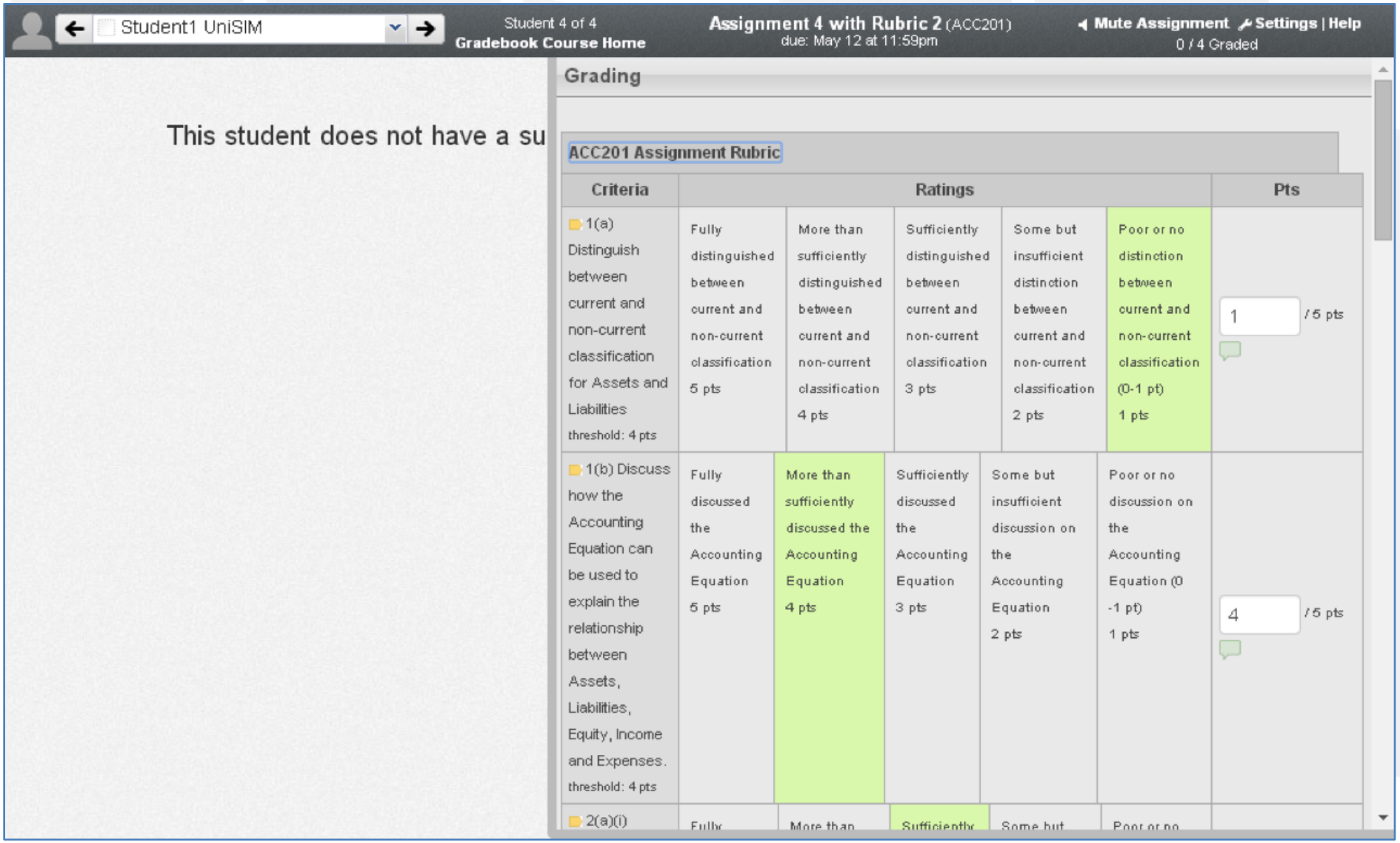
Outcomes Assessment



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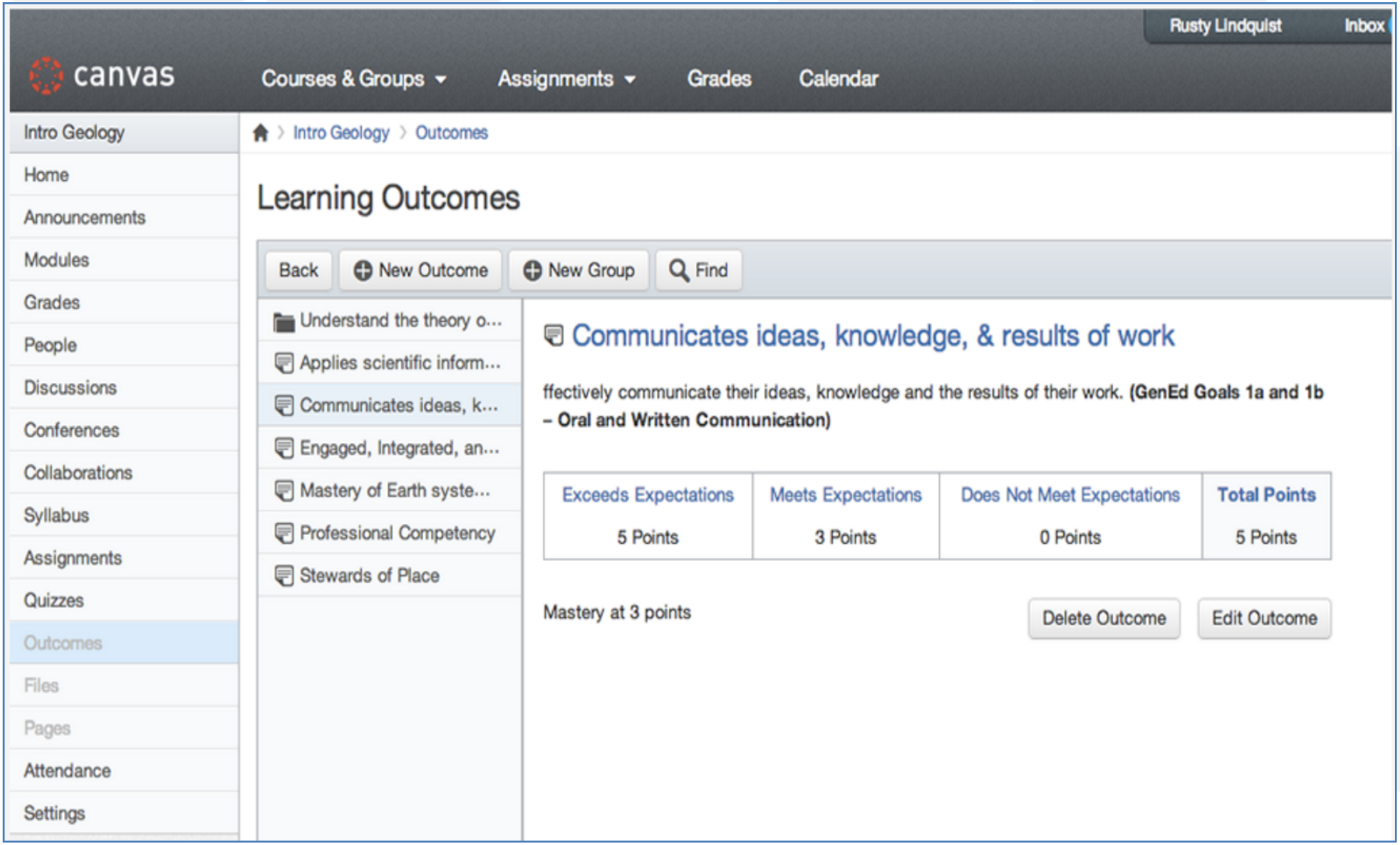
Outcomes Assessment



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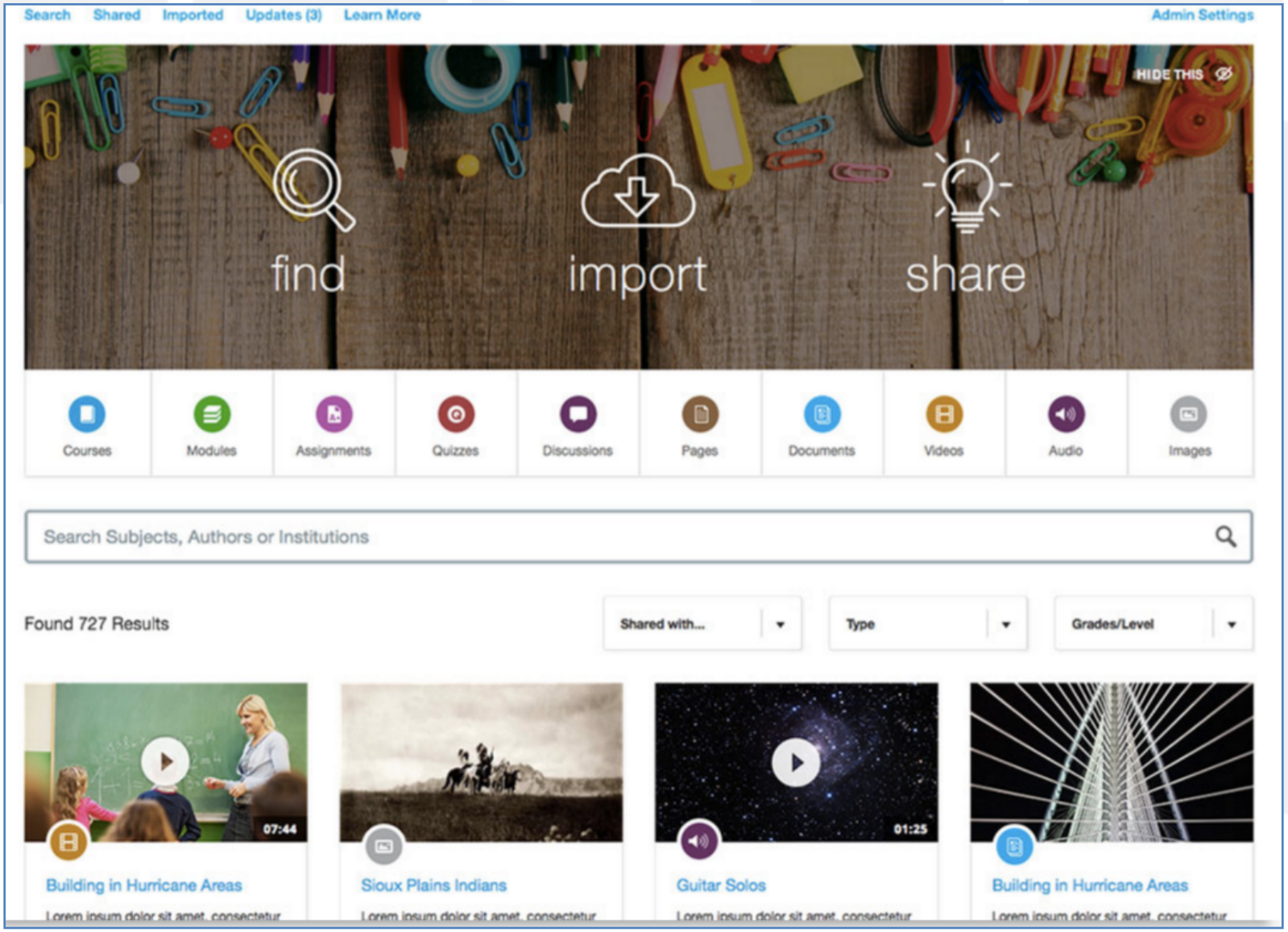
Community Sharing



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Online Course Catalog

http://unilearn.edu.sg

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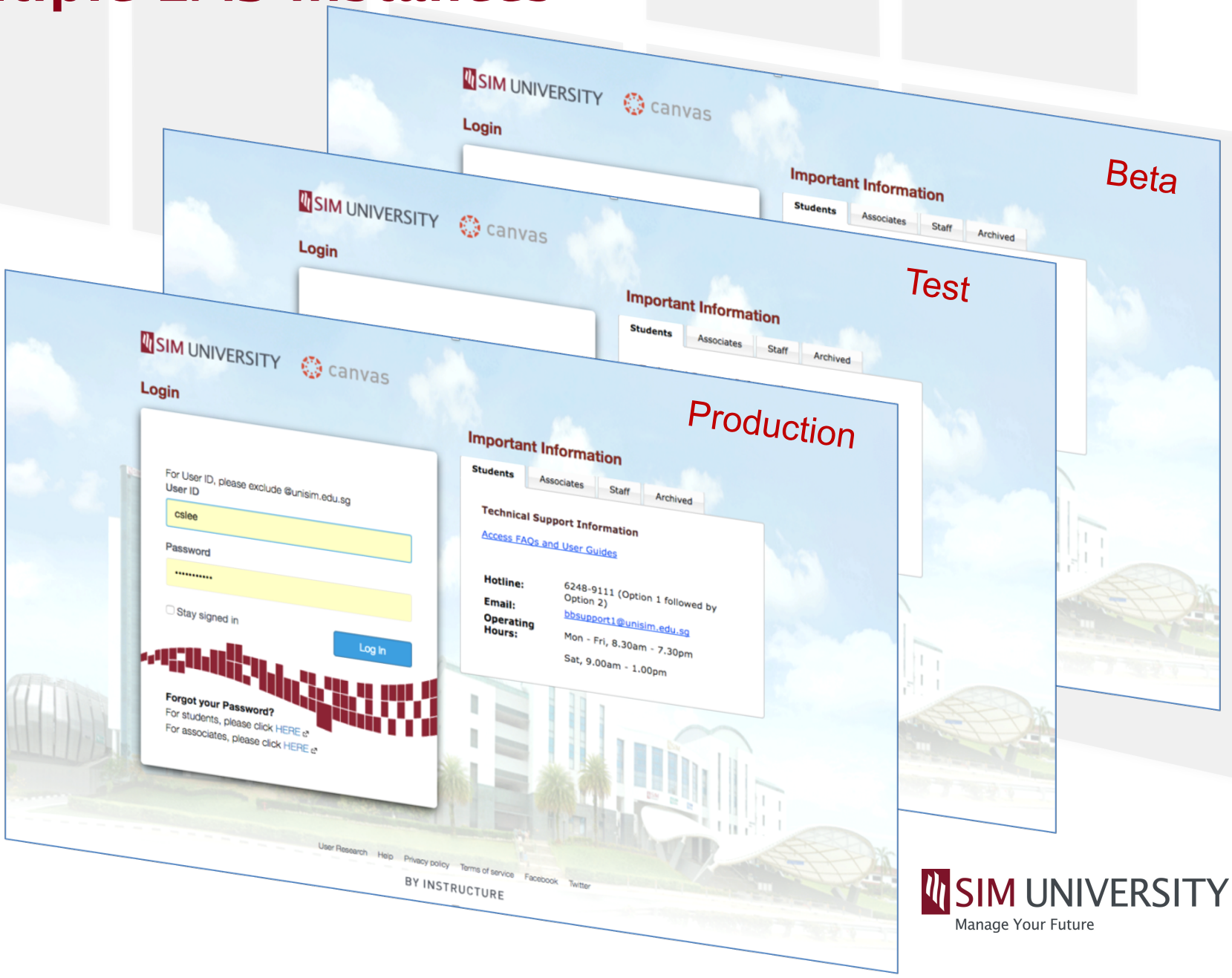
Multiple LMS instances



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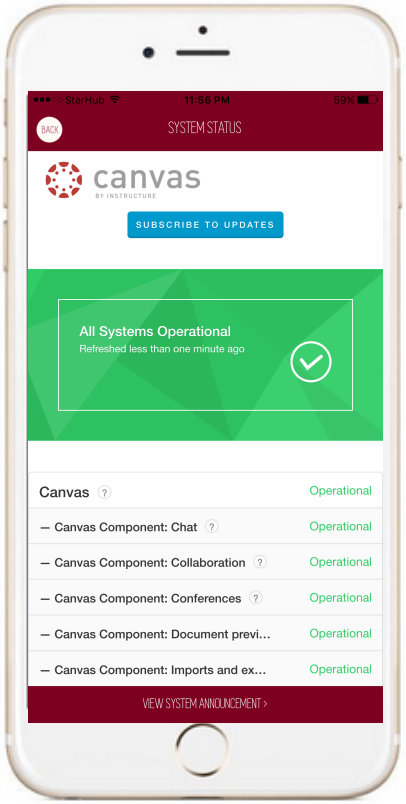
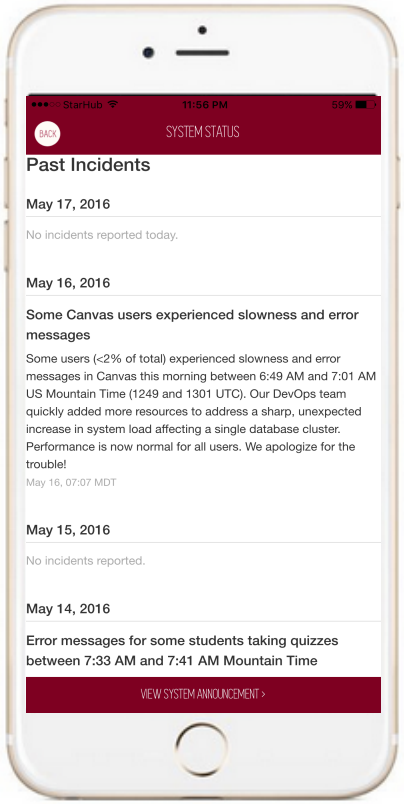
System Uptime

https://community.canvaslms.com/community/labs/uptime

UniSIM Backpack





http://status.instructure.com

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Cloud Security

Outsourcing Operational Responsibility ≠ Giving Up Your Accountability

Data Confidentiality

- Only essential info (name and email) is stored
- Ensure data privacy is intact
- All transfers of student data are secured and encrypted

IT Security Considerations

- Data Centre Tier Certification
- Data Centre Security Standards and Compliance
- Data Centre Site Inspection
- Service Level Agreement (SLA)
- Disaster Recovery Scenarios
- System Penetration Test
- Incident Management

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Disaster Recovery Scenarios

No	Scenario	Recovery Point Objective (RPO)	Recovery Time Objective (RTO)
1	Complete Loss of a Master Database	5 minutes	1 hour
2	Simultaneous Complete Loss of Master and Slave Databases	24 hours	6 hours
3	Database Destruction by Hacker	24 hours	6 hours
4	Complete Loss of Primary Hosting Facility	4 hours	Commercially Reasonable

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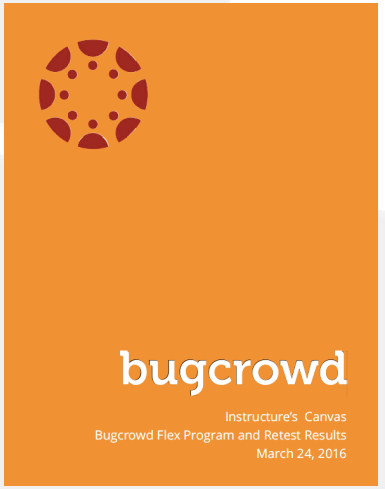
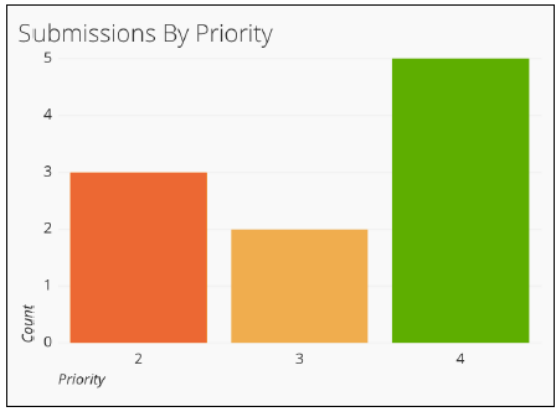
Security Assessment

- Crowd-sourced system penetration test on Canvas LMS
- Date: 17 Nov 2015 – 11 Dec 2015
- 138 vulnerability submissions 26 unique researchers

Title	Reference Number	Priority	Reward	Retest
Stored XSS via Groups	de61564ce42f9e9013c100f14031da9392d5f60b081a886f0c0ce605af56d7a0	2	$6,000.00	Resolved
Stored XSS via Outcomes	7391ca90e0fdf157143b12e0c602aa14a03d21e6ec129f80171ab9dcc1ed3284	2	$4,000.00	Resolved
Stored XSS in Quiz Question Bank as Teacher	1fd8f1db7cbd2a8d6076802b40cb8993438cea6cdd93b7c2b6440d8ab1ca7c19	2	$3,000.00	Resolved
Privilege escalation via IDOR : Change the behalf of another user All Notification Preferences	e31b26d4fe28dc894b4d7a116523f6b69387cc397cd63fff4466ed38cbfd0b75	4	$500.00	Resolved
Content Spoofing (iframe Injection via HTML Editor)	f224e7c58b711457bb73610d7853a5c5f27e25cfc7e43de2b220155a5dcb391e	3	$200.00	Resolved
User account information IDOR at /users/<user_id>	7d2e91c088b03ebc71ee33504832ebe572ecd8f84bc827e9e67cdffaf304e7ac	3	$200.00	Resolved
CSV Injection (Gradebook Export)	8944ad7281953f597cf6091becbeba36fbfda5dcddb745947c4ccfd14e172e1b	4	$200.00	Resolved
Course Page IDOR	90332ea307577359de9d50b47e0b97a112f50c26b6646416c4920017bbed518b	4	$200.00	Resolved
External Authentication Injection via HTML Editor	d8989daebdedcacaf512bf1312bfe1d9cfd44979359a833a58dda704a1012885	4	$200.00	**Unresolved**
Window Opener Property Bug via HTML Editor	3d253e7e68775ab8e17b8dfbca01d417fe5d59f1ca264f2ce933fb5c5541c8e3	4	$200.00	Resolved





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In summary…

Switching LMS is a challenging and impactful undertaking

- Due diligence to challenge the status quo
- Knowing your needs and wants
- Important to involve key stakeholders (from management to students) in evaluation process
- Massive efforts in change management

Journey to the Cloud

- Best practices in IT service management and accountability remain unchanged
- Balancing IT Agility with Cloud Security
- Management Buy-In is key

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Question & Answer

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Thank You

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