

Jing Qi, Dartmouth College • Jane Esco, Canvas Network

# LEVERAGING CANVAS LEARNING DATA TO INFORM MOOC DESIGN

Mission:  
InstructureCon  
0017

JULY 25-27, 2017 | KEYSTONE, COLORADO



CENTRAL EDUCATION AGENCY

39.6722° N, 105.9377° W



# AGENDA

- ➔ Share FAQs By Faculty Teaching Courses On Canvas Network
- ➔ Demonstrate Tools for Gathering Course Data
- ➔ Discuss How to Use Data to Improve Student Engagement

## About Jane



**Instructional Designer  
on Canvas Network team**

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## About Jing



**Dartmouth**

**Learning Analytic and LMS  
Specialist**

**Created a course  
on Canvas Network**

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# CANVAS NETWORK



Est. Jan 2013

# MISSION

To promote openness, innovation, and experimentation in education.



**ENROLLMENTS**



**FACULTY**

# MISSION

To promote openness, innovation, and experimentation in education.

210 +

**INSTITUTIONS**

880 +

**COURSES**

# RESEARCH



**New discipline-specific effectiveness inquiries**

**New approaches to teaching and learning**



**New courses**

**New technologies**

**New business models**

**New content approaches**

**New curriculum approaches**

**INNOVATION  
& EXPERIMENTATION  
& IN**





# EXPOSURE

**New marketing channels**  
**New lead opportunities**

# ANALYTICS IN COURSE DESIGN: LEVERAGING CANVAS DATA

**ENROLL**  
on canvas  
network



**FREE**

## (HE) Analytics in Course Design: Leveraging Canvas Data

Leverage Canvas Data and visualization techniques to make informed decisions about Canvas course design.

Self-paced  
**FREE**



## Analytics in Course Design: Leveraging Canvas Data

☆☆☆☆☆ 0 [Leave a Review](#)

**Grade/Level** Undergraduate, Graduate

**Shared With** Public

**Type** IMS Common Cartridge File (.imsc)

This course is designed to demonstrate common practices in leveraging Canvas data to inform effective course designs. This course will cover an overview of the available Canvas data, educational data mining techniques, and fundamental learning theories. This course will be structured with a set of commonly asked course design and student engagement questions, and examples on how to leverage certain Canvas data points to address a given question.

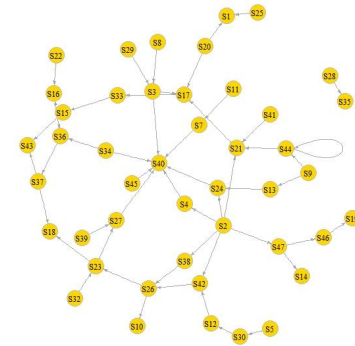
Education



**DOWNLOAD**  
from canvas  
commons

Apply the results in course design to enhance student learning

Analyze and visualize the learning data



- Gather the questions that are related to course design and student learning
- Identify the type of student-generated data that may help answer the questions

# Focus on Two Examples

## 1. Google Analytics

How do students navigate through course content?

Where do students exit?

## 2. Discussion Forum Data

How are students interacting in online discussions?

# COURSE DESIGN



→ How should the course home page be designed to make sure learners come back?

→ Do different course structures show a difference in learner navigation patterns?

→ How should my course design differ when a course is instructor-led versus self-paced?

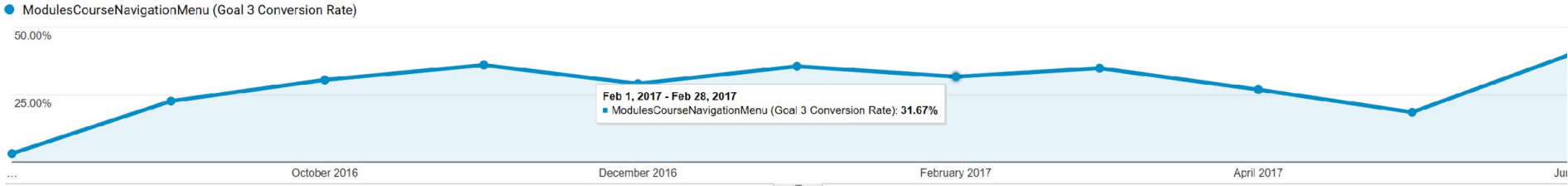
# Google Analytics

## Behavior Flow



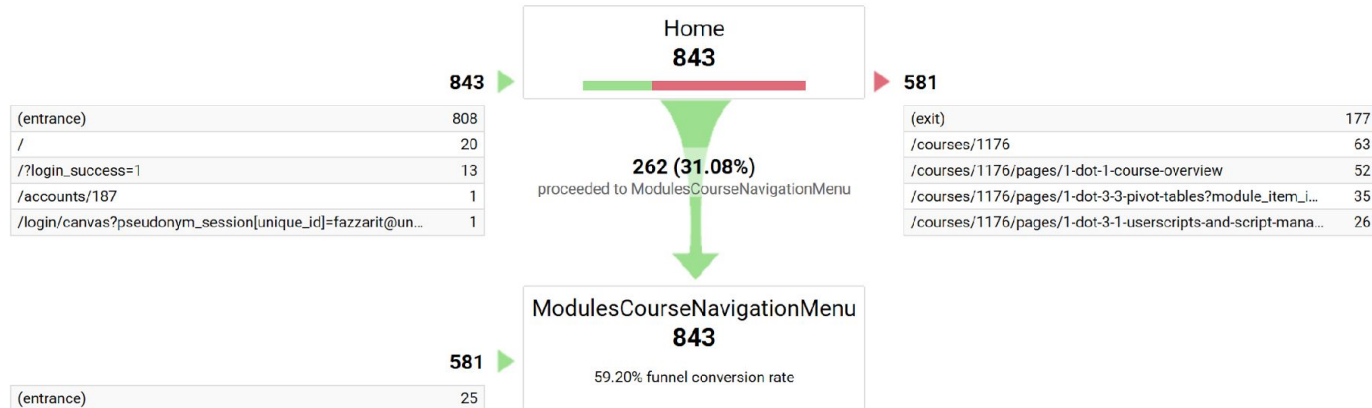
# Google Analytics

## Funnel Visualization



### ModulesCourseNavigationMenu

This Goal was completed in 843 sessions | 59.20% funnel conversion rate



## Poll

How should the course home page be designed to make sure learners come back?

Do different course structures show a difference in learner navigation patterns?

How should my course design differ when a course is instructor-led versus self-paced?



# COURSE DESIGN: Do Simple Better

2016-Q1


Home

Announcements

Modules

Badges

## Mars: The Next Frontier






NASA is preparing for a manned mission to Mars in 2030. Will you be prepared to join the crew? In this course, participants will learn basic facts about Mars and the essentials humans need for survival on the planet.

New to the course?

[Start Here!](#)

Returning student? Jump into the course here!



[Module 1: Get Acquainted with Mars](#)

[Module 2: Mars & Water: Can They Co-Exist?](#)

[Module 3: Breathable Air on Mars](#)

Make the home page visually engaging

Simplify the course navigation menu

Give new learners a place to start

Help returning learners pick up where they left off

# COURSE DESIGN: Try a Different Course Structure

## History of Boston Chronological Structure

☰ ▶ Get Started

☰ ▶ Lesson 1: Indians and the Pre-Puritans

☰ ▶ Lesson 2: Founding Boston

☰ ▶ Lesson 2 B: Boston in the Age of Cotton Mather

☰ ▶ Lesson 3: Boston: From Resistance to Revolution

☰ ▶ Lesson 3 B: Revolutionary Boston

☰ ▶ Lesson 4: The New Nation

☰ ▶ Lesson 4 B: Boston and the Industrial Revolution

## History of Boston Topic Structure

☰ ▼ Landscape of the City

☰ ▼ Character of the City

☰ ▼ Government

☰ ▼ People

☰ ▼ Economy

☰ ▼ Cultural Life

# COURSE DESIGN: Which format is best?

## Self-paced

- self-directed
- detailed instructions
- non-linear format
- all content open and available
- no instructor interaction
- multiple opportunities for self-check / reflection
- includes module requirements
- incentives for completion - badges / certificates

time-based

hard deadlines

learners move thru course together

discussions remain current and relevant

regular instructor interaction/feedback

useful format for research

multiple feedback avenues

incentives for completion - badges / certificates

## Instructor-led

# Focus on Two Examples

## 1. Google Analytics

How do students navigate through course content?

Where do students exit?

## 2. Discussion Forum Data

How are students interacting in online discussions?

# DISCUSSIONS



Does the frequency or quality of discussion posts vary across topic or module?



Which discussions forums generate the most posts and why?



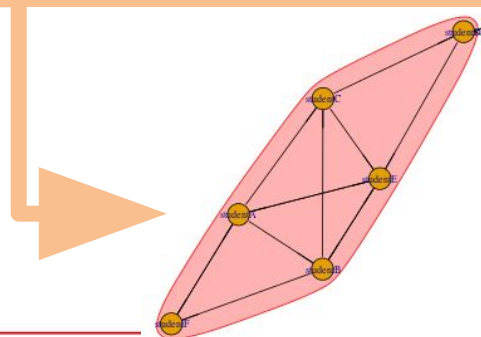
How can I generate more activity in the discussion forums?

# Discussion Interaction Data

## Discussion Data

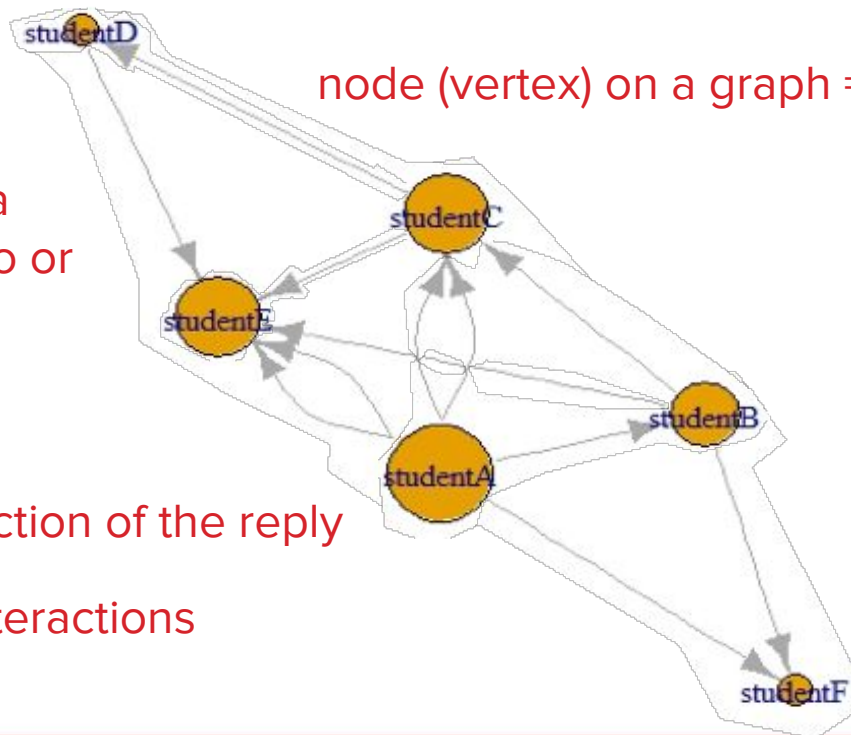
from	to	weight	group	entry_message	initial_thread_word_count		
S11	S41	511	Topic2	1. Multiple answers how to	511		
S8	S34	398	Topic2	I agree with the article on p	398		
S5	S22	484	Topic2	Asynchronous question and	484		
S32	S29	66	Topic2	The individual student acce	66		
S36	S30	680	Topic2	I agree we use the informa	680		
S7	S7	2125	Topic2	I plan to install Threadz to	2125		
S7	S7	691	Topic2	every thing they do	691		
S7	S7	1770	Topic2	The individual student acce	1770		
S22	S7	494	Topic2	okey thnk for help	494		

<https://www.dartmouth.edu/~breid/userscripts>



# Analyzing Discussion Data

## Social Network Analysis (SNA) and Network Graphs



node (vertex) on a graph = student

edge (link) on a graph = reply to or from a student

arrow on an edge = direction of the reply

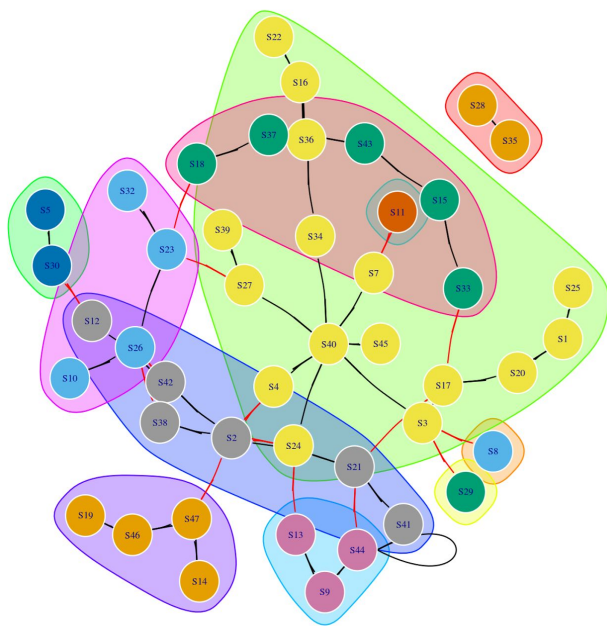
Size of a node a total interactions

# Analyzing Discussion Data

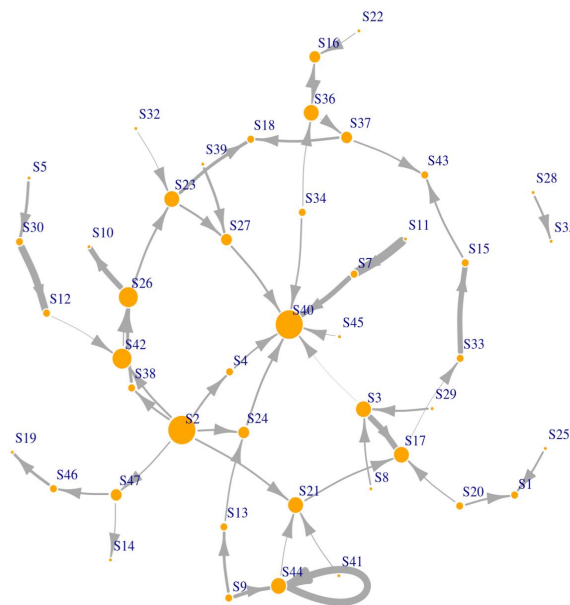
Shiny Application Powered with R

<https://nercompshiny.shinyapps.io/networkgraph/>

community detection for Topic1

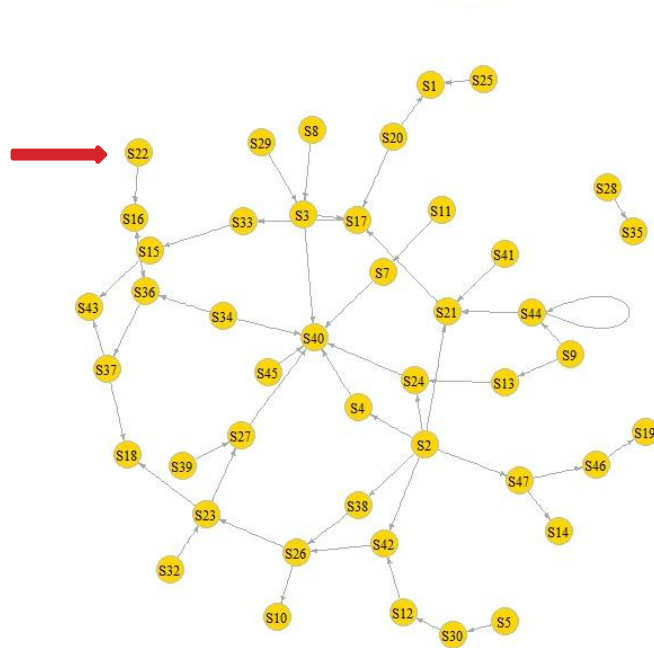


Topic1





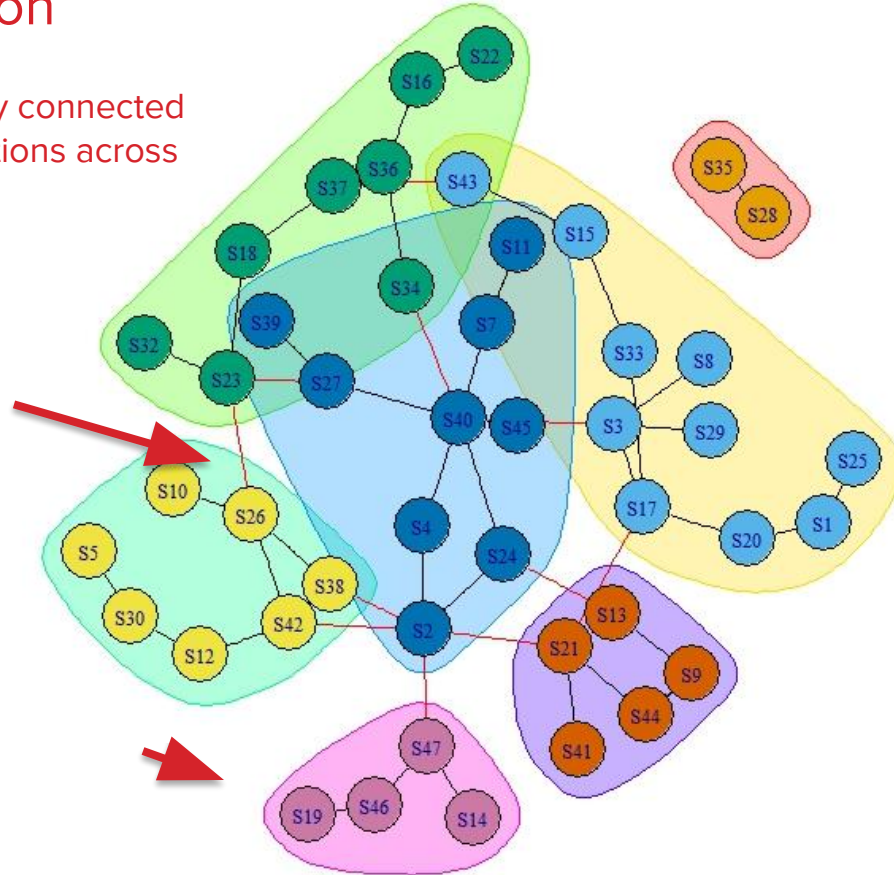
# Analyzing Discussion Data



# Community detection

Detects groups of densely connected nodes with fewer connections across groups

Bridge subsets/clusters



## Poll

Which discussion forums generate the most posts and why? Which discussions boards generate the most traffic – have more students views? (This is different from the number of discussion board postings, as many students may view [and read] the posts but not contribute.)

How can I generate more activity in the discussion forums?

# **DISCUSSIONS:** Improving Engagement

reflection  
&  
self-check  
activities

open-ended  
discussion  
prompts

instructor  
involvement

incentives  
badges  
certificates

peer review  
networking  
feedback  
activities

# RESOURCES – COLLECTING DATA

Google Analytics:

<https://support.google.com/analytics/answer/2785577>

<https://support.google.com/analytics#topic=3544906>

Canvas API:

<https://canvas.instructure.com/doc/api/index.html>

Userscripts and Userscript Manager:

<https://github.com/OpenUserJs/OpenUserJS.org/wiki/Userscript-Beginners-HOWTO>

Canvas-Specific Userscripts

<https://www.dartmouth.edu/~breid/userscripts>

Discussion Data - Social Network Analysis - Shiny App:

<https://jing-zen-garden.shinyapps.io/networkgraph/>

Sample Data: [http://www.dartmouth.edu/~breid/userscripts/learn\\_canvas\\_1176.csv](http://www.dartmouth.edu/~breid/userscripts/learn_canvas_1176.csv)

# MOOC RESOURCES

ENROLL in Jing's Canvas Network MOOC: Analytics in Course Design

<https://www.canvas.net/browse/dartmouth/courses/analytics-in-course-design>

DOWNLOAD Jing's Canvas Network MOOC: Analytics in Course Design

<https://lor.instructure.com/resources/8ea1a1a205474db4810b300ac5722947>

(use Canvas Network login credentials)

View and Enroll in Canvas Network Courses

<https://www.canvas.net/>

Offer a Course on Canvas Network

<https://info.canvas.net/offer-a-course>

# FUN FACT



this

THANK

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THIS PRESENTATION

WILL SELF-DESTRUCT

YOU