PRECALCULUS EMPORIUM

NEW LEARNING MODELS: MOVING THE MATH EMPORIUM ONLINE

The Future of the Textbook Symposium
October 24, 2014

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t

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Presenters

KRIS BIESINGER

PROJECT MANAGER, ONLINE PRECALCULUS EMPORIUM
UNIVERSITY OF GEORGIA

MYK GARN

ASSISTANT VICE CHANCELLOR FOR NEW LEARNING MODELS
UNIVERSITY SYSTEM OF GEORGIA

CHARLES KUTAL

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ASSOCIATE DEAN & CHEMISTRY PROFESSOR
UNIVERSITY OF GEORGIA

AGENDA

WHY PRECALCULUS?

THE EMPORIUM MODEL

THE EVOLVING DESIGN

NEXT STEPS

STEM Challenges

48 PERCENT OF BACHELOR'S DEGREE STUDENTS AND 69 PERCENT OF ASSOCIATE'S DEGREE STUDENTS WHO ENTERED STEM FIELDS BETWEEN 2003 AND 2009 HAD LEFT THESE FIELDS BY SPRING 2009.
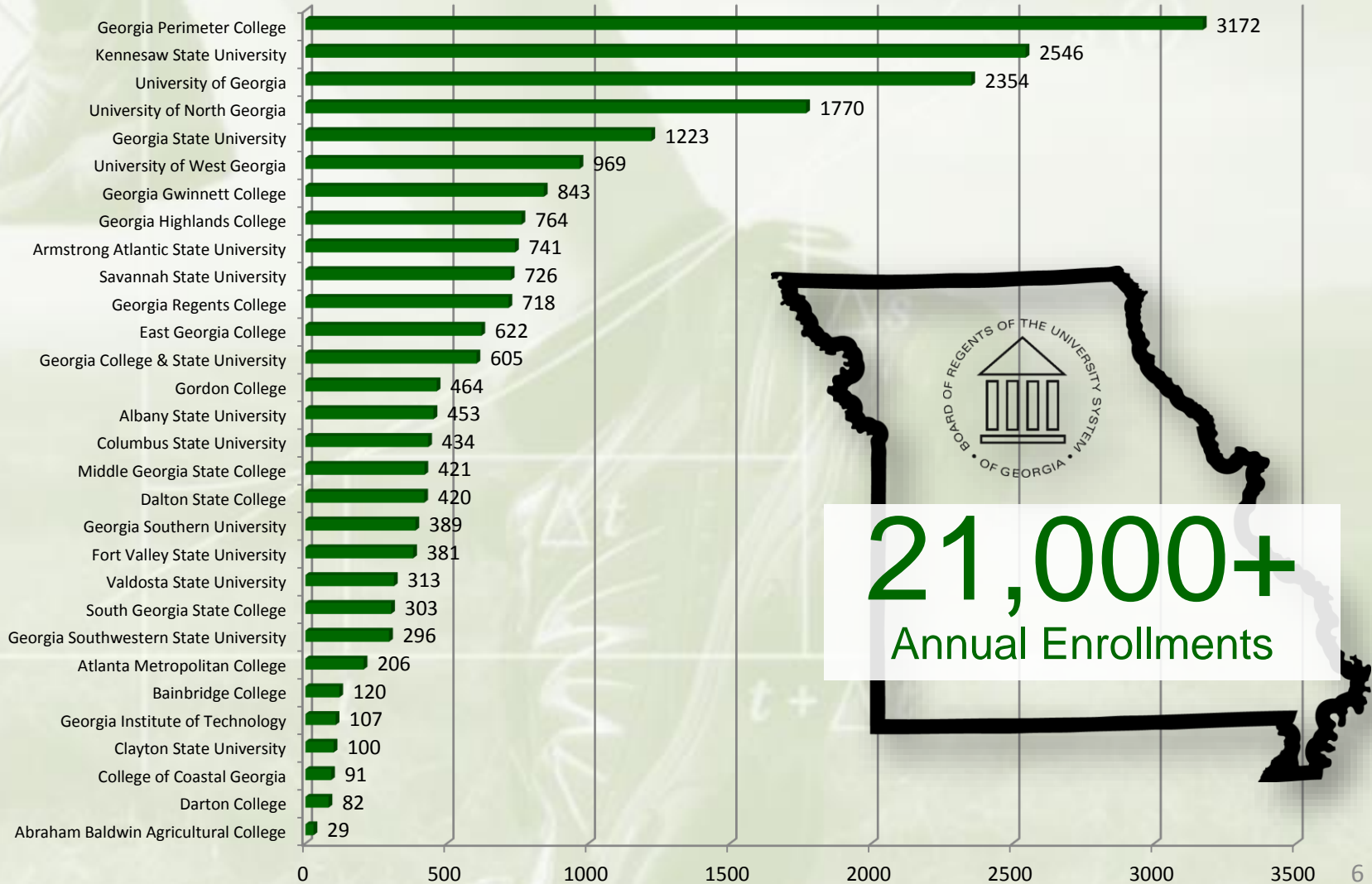
USG STEM Initiative

The USG STEM Initiative works with USG institutions and P-12 partners to increase:

1. The number of P-12 students who prepare for and are interested in majoring in STEM in college,

2. The success rates (retention, progression, and graduation) and number of students in college who pursue the STEM disciplines, and

3. The number of teachers who are prepared in science and mathematics.

Why Precalculus?

USG MATH 1113 (2012) Enrollments

College	Enrollment
Georgia Perimeter College	3172
Kennesaw State University	2546
University of Georgia	2354
University of North Georgia	1770
Georgia State University	1223
University of West Georgia	969
Georgia Gwinnett College	843
Georgia Highlands College	764
Armstrong Atlantic State University	741
Savannah State University	726
Georgia Regents College	718
East Georgia College	622
Georgia College & State University	605
Gordon College	464
Albany State University	453
Columbus State University	434
Middle Georgia State College	421
Dalton State College	420
Georgia Southern University	389
Fort Valley State University	381
Valdosta State University	313
South Georgia State College	303
Georgia Southwestern State University	296
Atlanta Metropolitan College	206
Bainbridge College	120
Georgia Institute of Technology	107
Clayton State University	100
College of Coastal Georgia	91
Darton College	82
Abraham Baldwin Agricultural College	29

21,000+
Annual Enrollments

Why Precalculus?

Chart showing MATH 1113 enrollment by institution:

- Georgia Perimeter College — 3172
- Kennesaw State University — 2546
- University of Georgia — 2354
- University of North Georgia — 1770
- Georgia State University
- University of West Georgia
- Georgia Gwinnett College
- Armstrong
- Georgia College
- Columbus State University
- Middle Georgia State
- Georgia Southern
- Fort Valley State University
- Valdosta State University
- South Georgia — 303
- Georgia Southwestern State University — 296
- Atlanta Metropolitan College — 206
- Bainbridge College — 120
- Georgia Institute of Technology — 107
- Clayton State University — 100
- College of Coastal Georgia — 91
- Darton College — 82
- Abraham Baldwin Agricultural College — 29

Axis: 0, 500, 1000, 1500, 2000, 2500, 3000, 3500

37.7%
Do Not Succeed

New Learning Models

Strategic Plan to Reshape USG in an Era of Change

The University System of Georgia adopted a bold Strategic Plan for the System that acknowledges a new environment for public higher education and positions the state's 31 public colleges and universities to meet changing needs and new expectations.

READ MORE ▸

"Disruptive innovations within the higher education enterprise require that we think critically about current strategies..."

(USG Strategic Plan, August 2013)

Goals

Access

High Quality

Affordability

Performance

Design Team

University of Georgia

Georgia State University

Georgia Perimeter College

Middle Georgia State College

Valdosta State University

Kennesaw State University

University of North Georgia

Georgia Institute of Technology

"The best way to predict the future is to invent it."

Alan Kay

Precalculus Emporium

THE EMPORIUM MODEL

Math Emporium

"The Emporium Model is as close to a silver bullet as one can get in the complex world of teaching and learning."

(The Math Emporium: Higher Education's Silver Bullet, Twigg, 2011)

Rigorous Affordability

"REDESIGNS IN MATHEMATICS INCREASED THE PERCENTAGE OF STUDENT SUCCESSFULLY COMPLETING A COLLEGE-LEVEL MATH COURSE BY 25 PERCENT ON AVERAGE WHILE REDUCING THE COST OF INSTRUCTION BY 47 PERCENT ON AVERAGE."

The **National Center** for **Academic Transformation**

(The Math Emporium: Higher Education's Silver Bullet, Twigg, 2011)
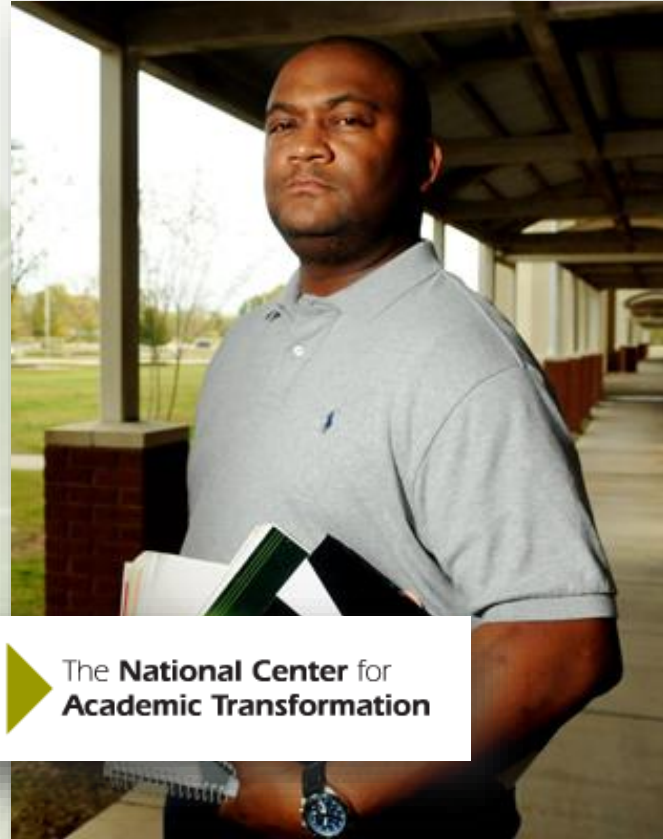
Ten Years of Research
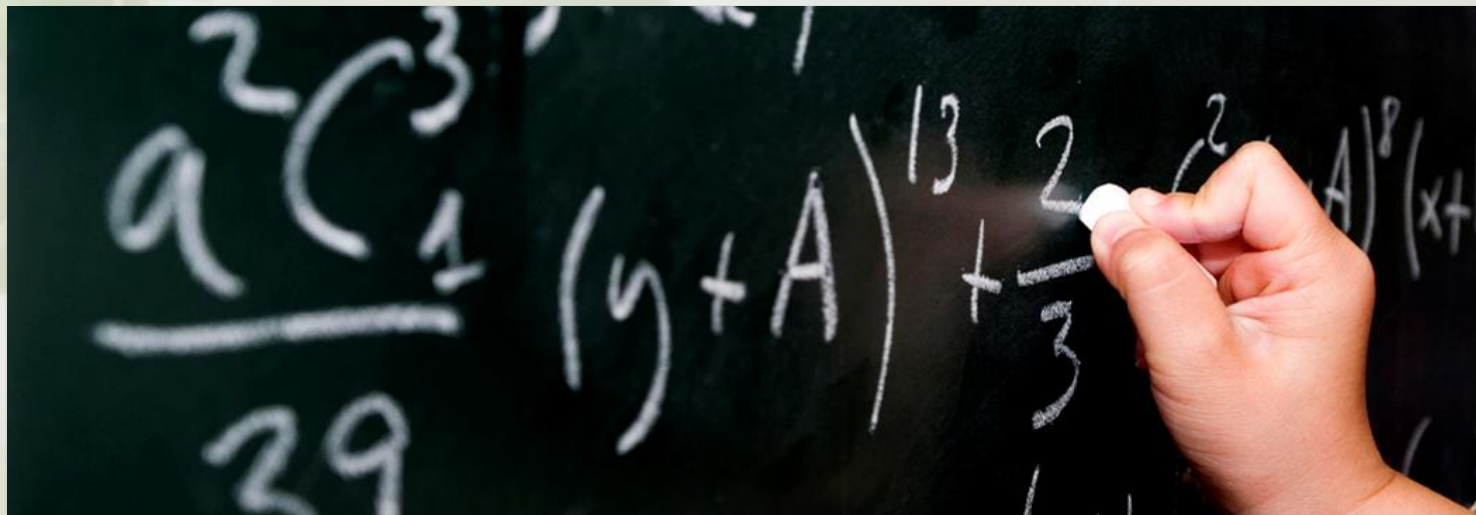
- **Require active learning**

- **Emphasis on doing as opposed to listening to how to do math**

- **Ensure sufficient time on task. Math activity is required (lab hours/exercises)**

- **Build in ongoing assessment and prompt (automated) feedback**

- **Monitor student progress and intervene when necessary**

- **Provide one-on-one, on-demand assistance from highly trained personnel**

Online Emporium

CONTENT

CONTEXT

GUIDED PRACTICE

LIVE STUDY HALLS

DISCUSSION FORUMS

TUTORIALS & TUTORS
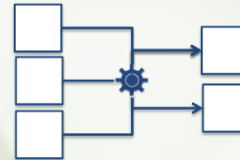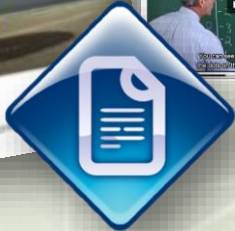
PROCTORED TESTING

15
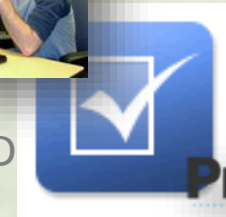
Precalculus Emporium

EVOLVING DESIGN

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Course Timeline

FA 2013 ———— SP 2014 ———— SU 2014 ———— FA 2014 ———→ SP 2015

DESIGN

Discussion Forum
Online Study Hall
Homework
Quizzes & Tests
Online Proctoring

ecore

CENGAGE Learning

WebAssign

coursera

smarthinking

ProctorU

PILOT I

5 Institutions
212 Students
6 Instructors
2 GTAs

Allison Arnold, UGA
Peggy Moch, VSU
Sutandra Sarkar, GSU
Sharon Evans, GPC
Barry Monk, MGSC
Kevin Yeomans, GPC

REDESIGN

goview
GEORGIA ONLINE
Virtual Instruction Enterprise Wide

Orientation Module
Gated Progress
Module Balancing
Weekly Pacing
New Videos
Adjusted Scoring
Practice Tests
3 Proctored Tests
Group Engagement

PILOT II

1 Institution
74 Students
1 Instructor
2 GTAs
2 Peer Mentors
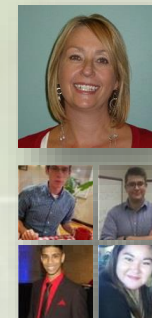
PILOT III

3 Institutions
150 Students
3 Instructors
2 GTAs
6 Peer Mentors

QUALITY MATTERS
PROGRAM
QM

Supplemental
Instruction
Study Groups

Course Elements

NEW ORIENTATION MODULE

1. **Welcome Letter from the Instructor**
2. **Fall Syllabus 2014 Clarifications**
3. **Course Nav Overview Video**
4. **Myths and Facts**
5. **Time Management Plan – Activity**
6. **Academic Honesty etc. – Activity**
7. **Orientation Quiz – Gatekeeper**

Content Browser | ▽

🏠 Home

Orientation and Course Essentials

🌐 Welcome Letter

📄 Fall Syllabus 2014

🌐 Video: Course Navigation Overview

📄 Myths and Facts about Online Classes

📁 Time Management Plan

❓ Academic Honesty Pledge

❓ Orientation Quiz
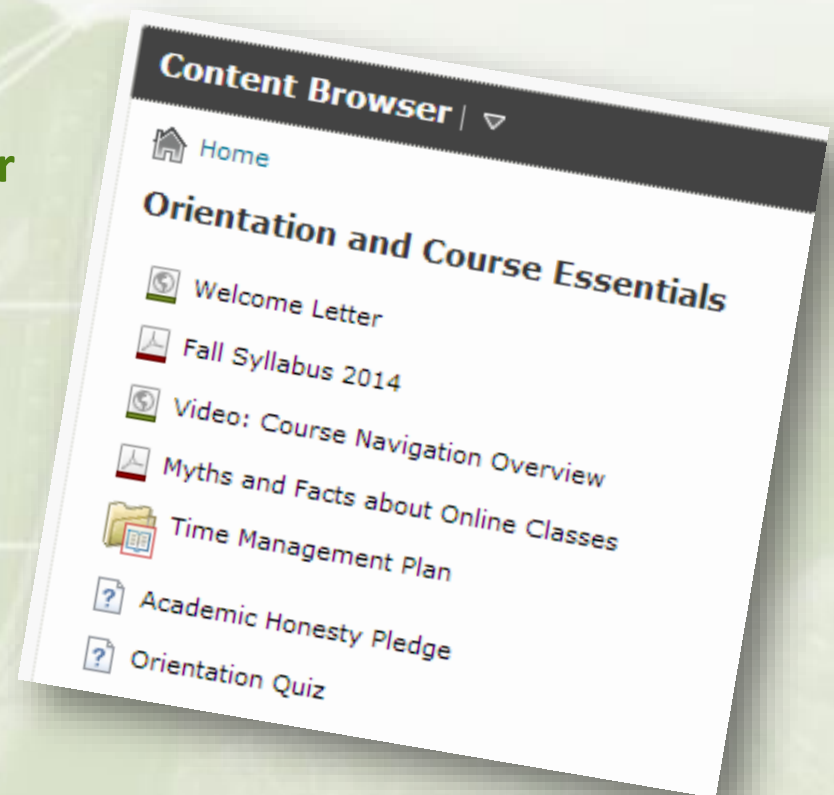
Course Elements

MODULE BALANCING

New Module 1: Chapters 2.2 – 2.5, Test September 11-12 **(Proctored)**
New Module 2: Chapters 2.6 – 4.5, Test October 8-9
New Module 3: Chapters 4.6 – 5.6, Test November 5-6 **(Proctored)**
New Module 4: Chapters 5.7 – 6.6, Test December 4-5
Chapters 7.1 – 7.2, Final Exam Dec. 11-12 **(Proctored)**

No Midterm – 3 Proctored Exams – Practice Test before Mod 1 Test

Element	Grade %
Homework	12%
Quizzes	12%
Mod Tests (4)	12.5% ea = 50%
Final Exam	25%
Participation	1%
TOTAL	100%

Course Elements

WEEKLY PACING & STRUCTURE

- **Content arranged by week**

- **Due Date every Monday night**

- **Time Management plan submitted during Orientation**

- **Progress monitoring and communication as needed**

- **Administrative Withdrawal for non-participation**

Content Browser | ▽

🏠 Home

Module 1 (Aug. 18th - Sept. 11th)

Module 1 Checklist

Week 1 (Aug. 18 - 25)

Week 2 (Aug. 26 - Sept. 1)

Week 3 (Sept. 2 - 8)

Week 4 (Sept. 9 - 15)
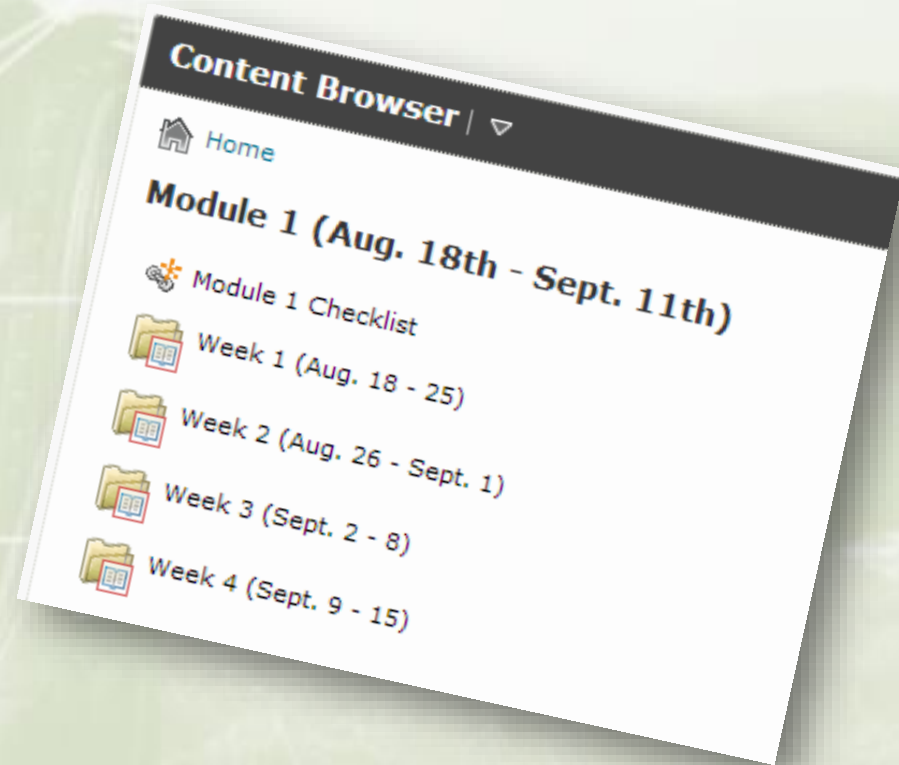
Course Elements

NEW CONTENT

Video: Graphs and Equations of Semi Circles
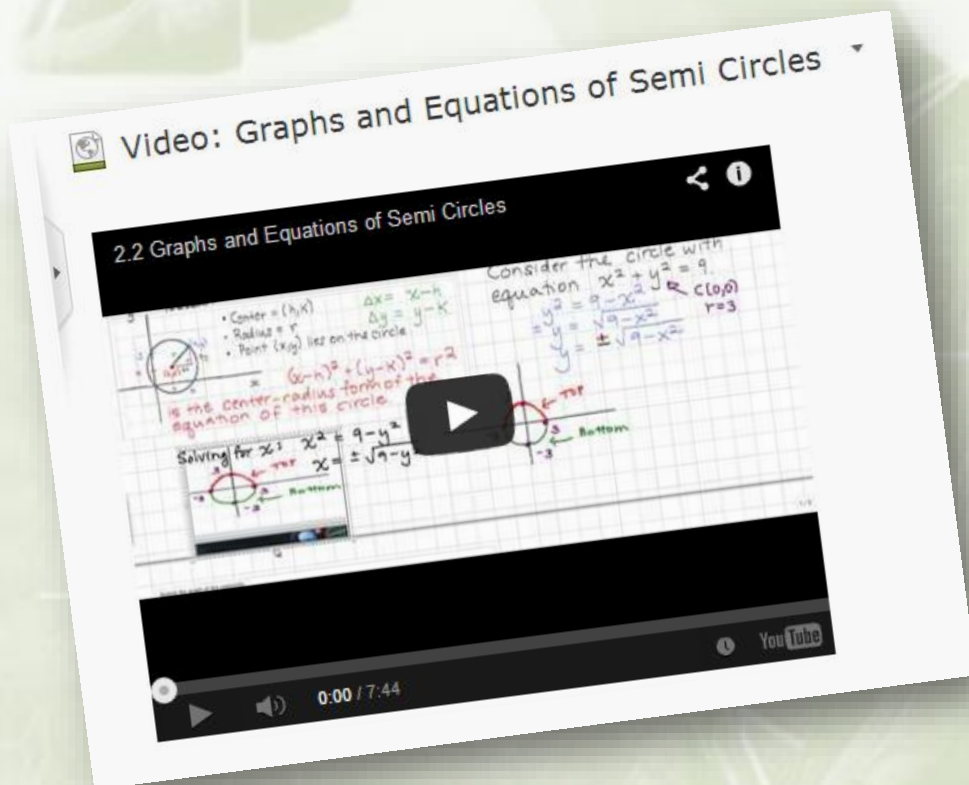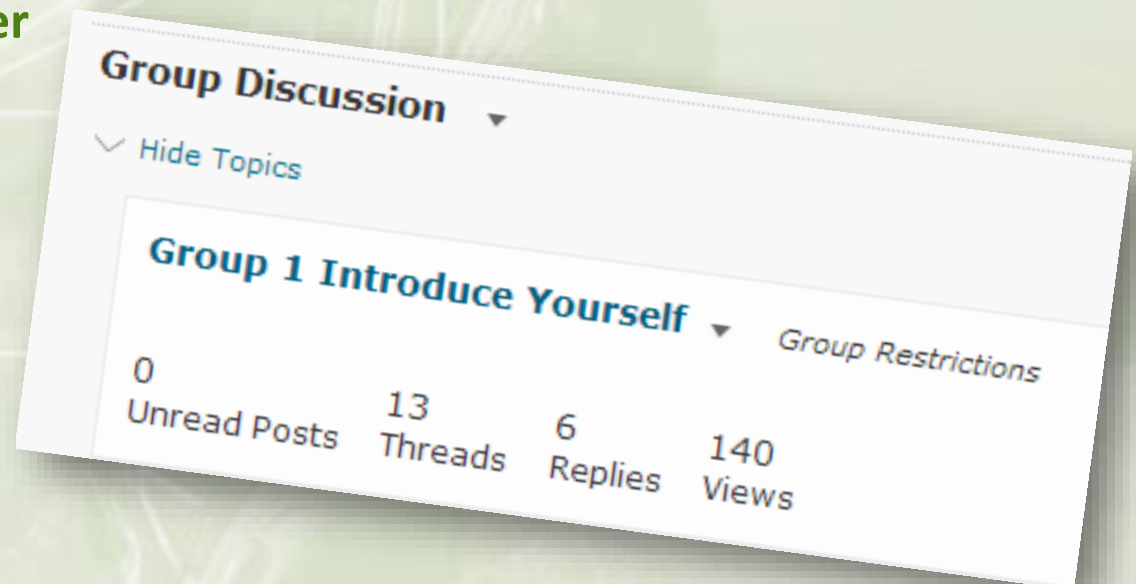
- **175 Instructor-made Videos**

- **2 – 10 minutes in Length**

- **All Captioned**

- **Hosted on YouTube**

- **Embedded in GoVIEW**

Course Elements

GROUP ENGAGEMENT

- **Automatic Enrollment to Groups**
- **15 students per group**
- **Private forums for each group**
- **Two 'Student Success Peer Mentors' monitor and**
- **Encourage small group discussion**
- **Less threatening**
- **environment**

Course Elements

MARKETING

- **New and improved website: onlineprecalculus.com**
- **New bookmarks for advisors**
- **Revised course blurbs in Banner**
- **Pre-semester email communication for enrolled students**

The Students

- **~ 50/50 Male / Female**
- **43% with Online Course Experience**
- **61% Chose Course Because Online**
- **Range of Traditional College Age and Older Adults**

Course Data
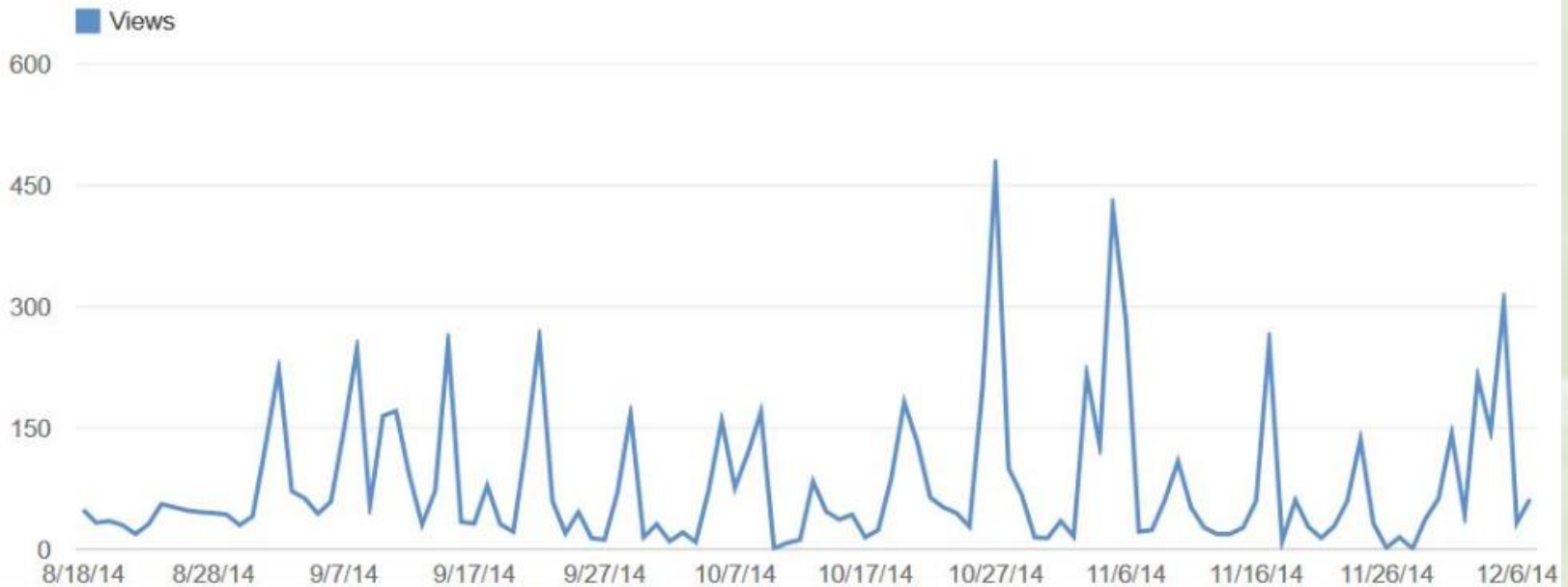
Feedback

"Thank you so much for your hard work in putting this class together and teaching everything clearly online! I am so glad to be taking this class with you."

"I think the content videos are a perfect length you teach everything that we need to know in the short time period! I love them!!"
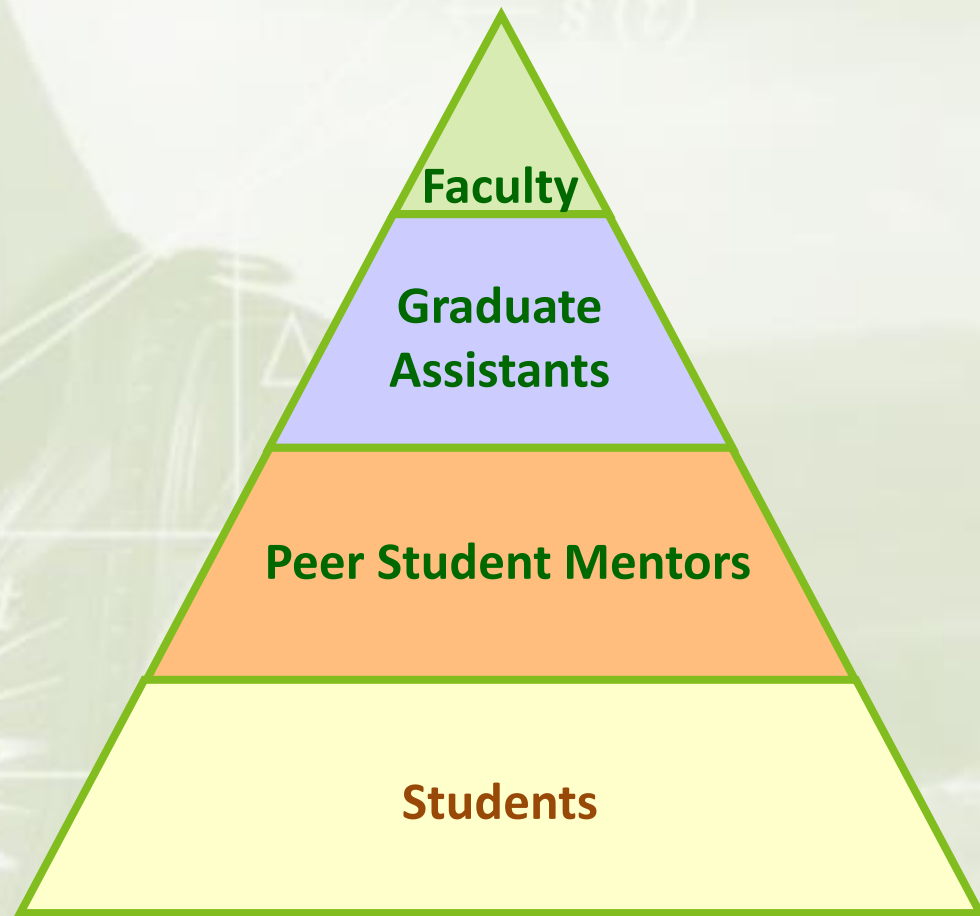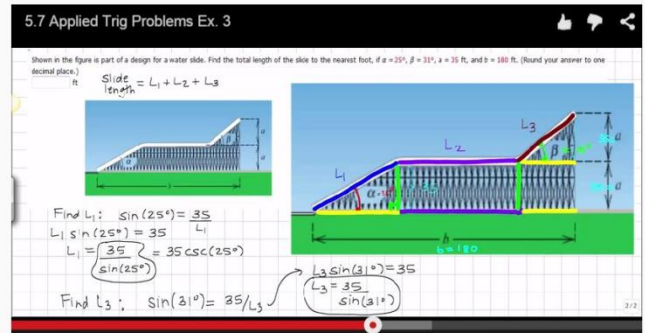
"I definitely think it is an effective way of teaching and definitely working for me! I have not made below a 97 on any assignment :) "

Reducing Costs
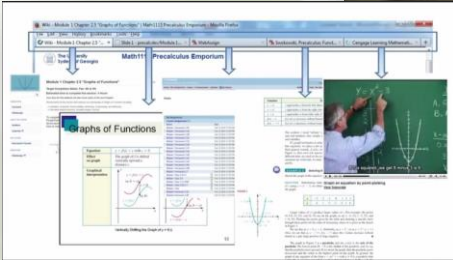
MATERIALS

INSTRUCTIONAL DELIVERY

Next Steps

"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete."

Buckminster Fuller

Student Study Groups

"Tell me, and I forget, show me, and I remember, involve me and I understand."

(Chinese Proverb)

30 Years of Research

- Based on multiple, proven cognitive learning theories and collaborative learning practices

- Promotes the growth of independent learners

- Non-expert, peer-facilitated study groups

- Emphasis on developing study strategies (thinking, reasoning, responsibility and reflection)

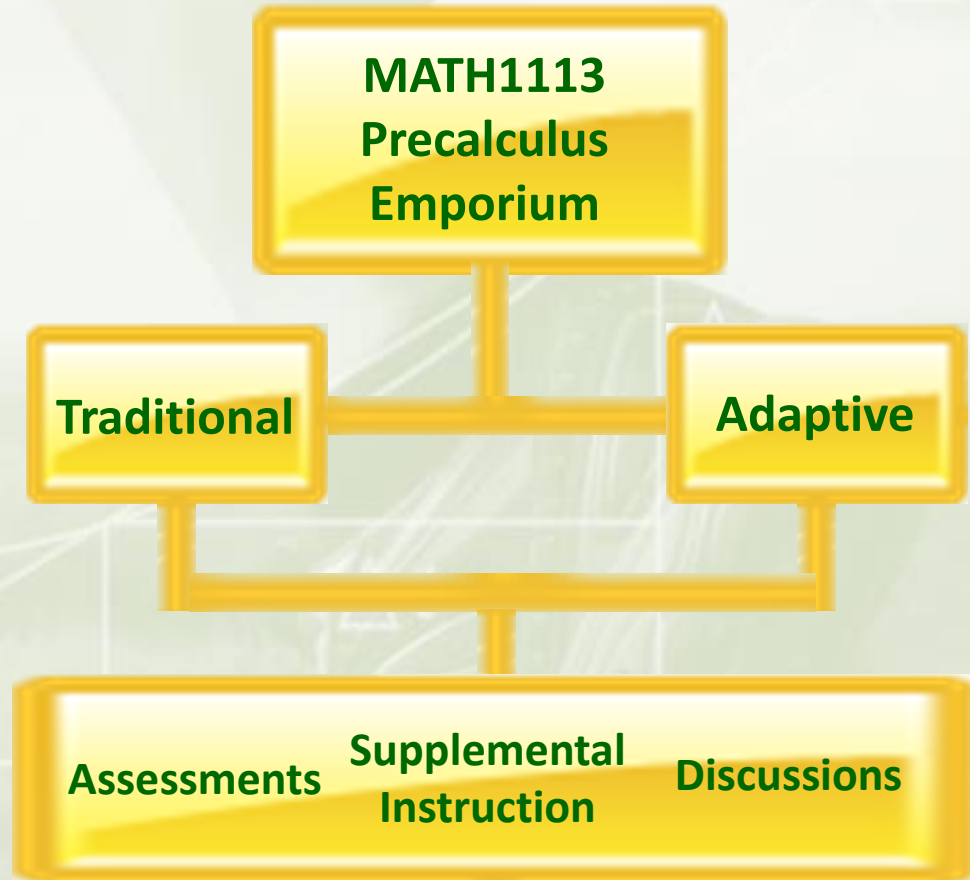- The more students participate in study groups the higher their final grade

Online Study Groups

Performance

MATH1113
Precalculus
Emporium

Traditional

Adaptive

Assessments   Supplemental Instruction   Discussions

MATCHING STUDENT CHARACTERISTICS WITH FORMAT

Discussion