

SEMINAL

*Student Engagement in Mathematics through an Institutional Network for
Active Learning*

Kennesaw State University

March 21, 2019



**KENNESAW STATE
UNIVERSITY**

What is SEMINAL¹

This is a five year \$3M NSF funded program of collaboration across institutions focused on increasing student success in mathematics. In collaboration with the APLU, the core institutions are UC Boulder, San Diego State and UN Lincoln. KSU was one of nine second cohort institutions selected to expand the program in 2018.

KSU was awarded \$93,000 for the three year program. (Jan. 2018–Dec. 2020)

The other second cohort institutions are:

- California State University, Fullerton;
- Loyola University Chicago;
- Morgan State University;
- The Ohio State University;
- University of Maryland;
- University of Oklahoma; and
- University of Texas Rio Grande Valley.
- California State University, East Bay;

¹<http://www.aplu.org/projects-and-initiatives/stem-education/seminal/about-seminal/>

SEMINAL Objectives

Faculty engaged in the program seek to

better understand both how to sustain success in implementing active learning in undergraduate mathematics classes and how to influence similar success at other institutions.

The success rates in core mathematics classes, Precalculus through Calculus 2 (P2C2), are seen as an impediment to students pursuing STEM field degrees. Much research has shown that students in classes characterized by active learning have higher pass rates and better grades.

While many institutions report thinking that active learning strategies are important, many also report difficulty in implementing changes along these lines. Another goal of this program is to facilitate use of active learning and creating departmental cultures that support it.

MATH @ KSU

- We have 48 full time permanent faculty including the Chair, two Assistant Chairs, tenure track faculty, lecturers, and one clinical faculty member.
- We have an additional 34 limited term or part-time faculty members currently listed with the department.
- We serve our own majors as well as STEM majors from the Colleges of Engineering, Science and Mathematics, and Computer and Software Engineering.
- We offer on the order of 65 sections of Calculus 1 each year, and had offered around 60 sections of Precalculus a year until recently.
- MATH 1190 is one of our G2C target courses (since 2015)
- DFW rates for the P2C2 courses are typically in the 35%–50% range.

The SEMINAL Program @ KSU

The focus is on Precalculus (MATH 1113) & Calculus 1 (MATH 1190)

SEMINAL Program Features Include:

- Creation of course related Strand Committees, committees that oversee groups of related .
- Creation of Course Coordinator positions for 1113 and 1190.
- Creation of an online repository on active learning. This includes relevant literature, materials developed within the department, as well as links to external resources.
- Through the Strand Committees, we have been developing common course topics lists, common objectives, syllabus templates, homework lists and online homework templates.

Course Coordinator

The duties of the course coordinator include:

- Meeting with all teaching faculty to discuss active learning and related resources
- Maintaining a repository of active learning materials for instructor use.
- Facilitating peer observation
- Communicating with instructors about guidelines or requirements (e.g. early alert reporting, surveys, etc.), or otherwise acting as liaisons between teaching faculty and the Strand Committees.
- Collected data on the use of active learning.
- Report on the program to the Department and the Dean

Early Observations

- A growing library of active learning activities/materials is available online for easy access to all teaching faculty.
- Two FLC cohorts ran throughout the 2018 calendar year to design and implement active learning. One was focused on MATH 1113, the other on the sequence 1190-2202. These groups created various active learning materials that kicked off the departments offerings to the repositories. The 1113 cohort also created the topics list, sample syllabus, learning outcomes, and homework lists presented to the appropriate Strand Committee.
- The early alert system—initiated as part of G2C—was extended to include MATH 1113 starting in fall 2018, and MATH 1112 (Trigonometry) starting spring 2019.

Early Observations

- A growing library of active learning activities/materials is available online for easy access to all teaching faculty.
- Two FLC cohorts ran throughout the 2018 calendar year to design and implement active learning. One was focused on MATH 1113, the other on the sequence 1190-2202. These groups created various active learning materials that kicked off the departments offerings to the repositories. The 1113 cohort also created the topics list, sample syllabus, learning outcomes, and homework lists presented to the appropriate Strand Committee.
- The early alert system—initiated as part of G2C—was extended to include MATH 1113 starting in fall 2018, and MATH 1112 (Trigonometry) starting spring 2019.

Early Observations

- A growing library of active learning activities/materials is available online for easy access to all teaching faculty.
- Two FLC cohorts ran throughout the 2018 calendar year to design and implement active learning. One was focused on MATH 1113, the other on the sequence 1190-2202. These groups created various active learning materials that kicked off the departments offerings to the repositories. The 1113 cohort also created the topics list, sample syllabus, learning outcomes, and homework lists presented to the appropriate Strand Committee.
- The early alert system—initiated as part of G2C—was extended to include MATH 1113 starting in fall 2018, and MATH 1112 (Trigonometry) starting spring 2019.

Early Observations

- In fall 2018, 87% of teaching faculty (1113/1190) reported using active learning activities in their classes. Also, half of the part-time instructors reported using *new* active learning in their classroom.
- 61% of full time faculty participated in the peer observation process as an observer, an observee, or both. The assistant chair who observes contingent faculty also used the new observation process in his observations.
- We are working towards common assessment. A proposed program is currently in the approval pipeline. We expect to implement the first departmental common final exam in fall 2019 (in one course).

Early Observations

- In fall 2018, 87% of teaching faculty (1113/1190) reported using active learning activities in their classes. Also, half of the part-time instructors reported using *new* active learning in their classroom.
- 61% of full time faculty participated in the peer observation process as an observer, an observee, or both. The assistant chair who observes contingent faculty also used the new observation process in his observations.
- We are working towards common assessment. A proposed program is currently in the approval pipeline. We expect to implement the first departmental common final exam in fall 2019 (in one course).

Early Observations

- In fall 2018, 87% of teaching faculty (1113/1190) reported using active learning activities in their classes. Also, half of the part-time instructors reported using *new* active learning in their classroom.
- 61% of full time faculty participated in the peer observation process as an observer, an observee, or both. The assistant chair who observes contingent faculty also used the new observation process in his observations.
- We are working towards common assessment. A proposed program is currently in the approval pipeline. We expect to implement the first departmental common final exam in fall 2019 (in one course).

The SEMINAL Team @ KSU

- Jennifer Vandebussche (PI): jvandenb@kennesaw.edu
- Kadian Callahan (co-PI): kcallah6@kennesaw.edu
- Lake Ritter² (co-PI): lritter@kennesaw.edu
- Erik Westlund (co-PI): ewestlun@kennesaw.edu

SEMINAL Website

<http://www.aplu.org/projects-and-initiatives/stem-education/seminal/about-seminal/>

Questions?

²Feel free to contact me at lritter@kennesaw.edu for additional information.