East Carolina University General Education Assessment Action Plan Progress Report

GENERAL EDUCATION COMPETENCY AREA: MATH

ASSESSMENT CYCLE: 2016-17 to 2019-20

INSTRUCTIONS: The completed Progress Report (to be completed in the last academic year of the assessment cycle) should be sent to the Dean of the college and copied to Kristen Dreyfus (springerk@ecu.edu) and Yihui Li (liy17@ecu.edu) **by the end of January 2020**. For each action planned please mark the status (Complete, In Progress, Not Started, or Not Applicable) and update the Progress on the Unit Response, Responsible Party and Timeline.

a. Pedagogical / Curriculum

Planned Action # 1: Switch from MyMathLab to ALEKS

Starting in Fall 2016, the Math 1065 Course Coordinator, began piloting sections of Math 1065 using ALEKS (adaptive learning platform that uses a mastery-based approach to learning mathematics). Due to several technical issues with MyMathLab, and the success of students using ALEKS, all sections of Math 1065 switched to using ALEKS starting Summer 2017.

Action Implementation Status (Mark One)				Responsible Party	Timeline
Complete	In Progress	Not Started	N/A		
☑	☐	☐	☐	April Talbert	Completed Summer 2017

Progress on Planned Action # 1

All sections of Math 1065 use ALEKS.

Planned Action # 2: New Format for Teaching Math 1065

In additional to using ALEKS, the pilot sections of Math 1065 follow a different format. Class meets for 1 hour and 50 minutes in the CAVE (or computer lab). In class the instructor provides mini lectures to groups of students. Students are assigned to groups based on their performance on assignments. If a student is not assigned to a group, then he/she has the option to either attend the group mini lecture or continue working in ALEKS. There are tutors and GTAs in the class to help students that do not participate in the groups. Another key difference in the pilot sections is the CAVE hour requirement. Instead of the weekly requirement of 3 CAVE hours (a minimum requirement), each student's CAVE hour requirement is based on his/her performance in the course. In general, a student whose overall grade and/or test grade is below a 70% must complete a minimum of 2 CAVE hours each week. A student whose overall grade and test grade is a 70% or higher must complete a minimum of 1 CAVE hour each week.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	April Talbert	Completed Fall 2019
☑	☐	☐	☐		

Progress on Planned Action # 2

All sections of Math 1065 in Fall 2019 are being taught in the new format: class meets 1 hour and 50 minutes in the CAVE, student CAVE hour requirement is based on performance in the course. We will continue using this format going forward.

Planned Action # 3: Co-remediation Approach

During Fall 2018, the Math 1065 Course Coordinator will be piloting a co-remediation model. Students that would typically complete Math 0001 and then take Math 1065 are taking these courses simultaneously. The co-remediation courses are Math 0001 section 3 and Math 1065 section 21. Math 1065 section 21 is composed of the students in section 3 of Math 0001 and students that placed into Math 1065 via SAT/ACT scores, Accuplacer, or Summer Bridge placement.

The unit plans to continue this co-remediation pilot during Spring 2019. During Summer 2019, the unit plans to look at student success in this model and analyze results to determine if more co-remediation sections should be offered. If this co-remediation model is successful, then the unit will need additional resources and a larger CAVE before full implementation can be completed.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	April Talbert	Fall 2018-ongoing
☐	☑	☐	☐		

Progress on Planned Action # 3

The Math 1065 Course Coordinator did run pilots of co-remediation during Fall 2018 and Spring 2019. Based on the successs of these pilots, April Talbert and Johannes Hattingh applied for and was awarded a Math Pathways grant from the UNC System Office for the 2019-2020 academic year to answer the question of which approach to remediation (sequential or co-rememdiation) leads to the highest level of student learning and success. The research study sections of Math 1065 that will be providing data to answer this question will be offered Spring 2020.

b. Student Support Services

Planned Action # 4: Tutorial Support

The CAVE is open 52-56 hours a week. Math 1065 students can go to the CAVE during any of these hours in order to receive individualized help from a CAVE tutor and/or GTA.

Math 1065 tutoring is also offered by the Pirate Academic Success center.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	April Talbert and Pirate Academic Success Center	Already in place since Fall 2012
☑	☐	☐	☐		

Progress on Planned Action # 4

Due to the change in the teaching format of Math 1065, the CAVE tutorial hours had to be reduced. During Fall 2019, the CAVE is open 40 hours a week for students to receive individualized help from a CAVE tutor or GTA.

Math 1065 tutoring is still offered by the Pirate Academic Success Center.

Planned Action # 5: Advising

The unit plans to share with advising that students scored higher if they waited one semester (up to 1 year) to take Math 1065 for the first time. Hopefully this will encourage students to wait at least 1 semester before attempting Math 1065 is their programs will allow it (not delay their graduation date).

Action Implementation Status (Mark One)	**Responsible Party**	**Timeline**

Complete	In Progress	Not Started	N/A	April Talbert	Completed Spring 2019
☑	☐	☐	☐		

Progress on Planned Action # 5

In the beginning of Spring 2019 April Talbert sent an email to Jayne Geissler and LeAnn Etheridge about the finding from the 2016-2017 Assessment Report (students scored higher if they waited one semester, up to 1 year, to take Math 1065 for the first time). It was asked that this finding be shared with all advisers and that students whose majors did not require Math 1065 to be taken the first semester in order to finish in 4 be directed to wait at least 1 semester before taking Math 1065.

Planned Action # 6: 2018 Summer Bridge Program

The Math 2018 Summer Bridge Program is an online program that helps prepare incoming students for their first math course at ECU. Students self-selected to participate in the Math 2018 Summer Bridge Program.

The unit is collecting data on the Summer Bridge students that placed into a higher math course than they placed by SAT/ACT. Some of the data being collected includes: initial knowledge check score, total time spent in ALEKS, percent of topics learned/mastered in ALEKS, major, placement test score, grade earned in course placed into, SAT/ACT scores, unweighted high school GPA. The unit plans to submit a request to IPAR (during Summer 2019) to analyze this data and provide answers to some questions: does the initial knowledge check score predict success on placement test, does the percent of total topics learned/mastered predict success on placement test, should we require a minimum number of topics to be completed in order to take the placement test (what should that number be), does the total amount of time spent in ALEKS predict success on placement test, should we required a minimum amount of time spent in ALEKS in order to take the placement test (what should that time be), do the current cut off scores for the placement test predict success in math course placed into (if not then what should our new cut off scores be), do ACT/SAT scores predict success on the placement test, does unweighted high school GPA predict success on the placement test.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	April Talbert	Summer 2018-Summer 2020
☐	☑	☐	☐		

Progress on Planned Action # 6

The Department of Mathematics decided to run another Summer Bridge Program in Summer 2019 in order to increase the sample size of students passing the Summer Bridge Program placement test and completing their first math course at ECU. The unit plans to submit a data request to IPAR at the end of the Spring 2020 term to analyze data collected on Summer Bridge Program participants that passed the placement test.

c. Faculty Development

Planned Action 7# : Faculty and GTAs

The unit requires faculty and GTAs teaching Math 1065 to attend all Math 1065 meetings (3-4 meetings a semester). The first Math 1065 meeting happens before classes start and it acts as a training. During this training the 1065 Course Coordinator covers: important course policies, first day of class expectations, first day of class attendance policy, first week duties in CAVE, course documents (syllabus, calendars, time sheets), and an overview of how to use the Math 1065 course pack.

Faculty new to teaching Math 1065 are mentored by the 1065 Course Coordinator. All GTAs teaching Math 1065 are mentored by other math faculty.

Faculty and/or GTAs that will be teaching Math 1065 for the first time are required to attend an ALEKS training hosted by the 1065 Course Coordinator (typically the semester before teaching Math 1065). Before the training everyone is given a student ALEKS account. The coordinator asks everyone go into an ALEKS course and work as a student (complete tools tutorial, complete initial knowledge check, and work on an assignment). This gives the faculty and GTAs an opportunity to experience what their Math 1065 students will be doing and makes them better prepared to explain how ALEKS works to their students. During the ALEKS training the 1065 Course Coordinator answer questions the faculty has about the student side of ALEKS and then gives a presentation on how to best use the instructor side of ALEKS.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	April Talbert	Completed Summer/Fall 2017
☑	☐	☐	☐		

Progress on Planned Action # 7

The unit requires all faculty and/or GTAs teaching Math 1065 to attend all Math 1065 meetings. Faculty and/or GTAs new to teaching Math 1065 are required to attend an ALEKS training hosted by the 1065 Course Coordinator before classes start. The Math 1065 Course Coordinator continues to mentor faculty new to teaching Math 1065 while GTAs are mentored by other math faculty.

Planned Action 8 # : CAVE Employees

All CAVE tutors are required to complete 4 modules in ALEKS, earning a 100% on each module, before being hired to work in the CAVE as a tutor.

Additionally, all CAVE employees (new and returning) are required to attend a face to face training in the CAVE before the fall semester begins. During this training the CAVE Director covers: CAVE polices, CAVE employee code of conduct, how to clock in/out, expectations when working the front desk, expectations when tutoring, tutoring best practices, how to help students register for ALEKS, how to help students register for tests, when to provide help to a student on a problem in ALEKS, how to determine if the student is completing a random knowledge check versus a scheduled knowledge check, and how to encourage student thinking and collaboration.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	April Talbert	Completed Summer 2017
☑	☐	☐	☐		

Progress on Planned Action # 8

All CAVE tutors complete 4 modules in ALEKS (earning a 100% on each module) before being hired to work in the CAVE. All CAVE tutors (new and returning) are required to attend a face to face training in August before the fall semester begins.

d. Other Areas

Planned Action # 9: Math 1050 Initiative

In the Fall of 2017, the math department wanted to redesign Math 1050 and offer the course to all majors that were not required to take Calculus. A committee was formed and tasked with developing new curriculum that would be consistent for all instructors teaching Math 1050. The new curriculum, which includes an algebra and personal finance unit, a geometry unit, a statistics unit, and a probability unit was reviewed and approved by other departments.

While redesigning the course, Susan Howard and Joseph Bland received The UNC Student Success Grant in the Spring of 2018. The requirement of this grant centered on utilizing an adaptive learning technology to help improve student success. To make the course consistent for all instructors and to fulfill the requirements of the Student Success grant, a course pack was developed and the ALEKS software was incorporated. In ALEKS, students can complete homework assignments, quizzes, and practice tests to help prepare for the actual tests that are offered in class. To help monitor student progress throughout the semester, ALEKS utilizes knowledge checks, which can be given at various points throughout a semester. For Math 1050, knowledge checks have been set at the beginning, middle, and end of the semester. A report will be completed at the end of the semester to review how well students progressed in Math 1050 while using the ALEKS software.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	Jospeh Bland	Completed Fall 2018
☑	☐	☐	☐		

Progress on Planned Action # 9

Following the redesign of Math 1050 over the summer of 2018, the fall semester of 2018 began the initial semester where all 1050 sections followed a uniform curriculum. Every instructor taught from the same course pack while students completed their out of class coursework in ALEKS. The work completed in ALEKS included homework and quizzes. ALEKS also utilizes knowledge checks to monitor student progress, including an initial knowledge check that determines how much knowledge students possess with respect to topics found in Math 1050. This initial knowledge then determines what path a student will follow throughout the course; additional knowledge checks are given throughout the course to ensure students are retaining the content they are learning along the way.

In the fall of 2018, all face to face sections met in traditional classrooms two days a week for 75 minutes. In the spring of 2019, two pilot courses met in a computer lab where the instructor taught for 30-40 minutes each class and then allowed students to use the remaining time to begin working in ALEKS while in class.

The fall 2018 semester had an initial knowledge check average for all students who completed the class of approximately 29%. The final knowledge check average for the same students ended at 57%. The spring 2019 semester had an overall initial knowledge check average of 25%, and a final knowledge check average of 53%. If we break the spring semester down into the traditional sections and the two pilot sections that met in the computer lab, the results are significantly different with respect to the final knowledge check. The traditional sections had initial and final knowledge checks averages of 25% and 49%, while the two computer based sections had initial and final check averages of 25% and 70%. All future sections, including the fall 2019 semester, will be computer based. Additional data is available if requested.

Planned Action # 10: New Math 1064 Course

At the request of the College of Business, a new course (Math 1064) has been created to replace Math 1066 for Business students. This work included developing the syllabus, preparing teaching materials, such as tests, quizzes, handouts, creating content and recording videos for the Distance Education sections, reevaluating the assessment tools and criteria, as well as the placement and the pre-requisites. Currently, we are in the process of teaching Math 1064 for the first time. The work ahead will focus on making improvements and adjustments based on the feedback from the students and the faculty, and on students' performance.

Action Implementation Status (Mark One)				**Responsible Party**	**Timeline**
Complete	In Progress	Not Started	N/A	Sviatoslav Archava	Completed Fall 2018
☑	☐	☐	☐		

Progress on Planned Action # 10

Math 1064 course was created over the Summer 2018 and was taught for the first time in the Fall 2018 semester. Math 1064 Instructors' group creates a common final exam for the course every semester. Students' performance on the final exam was analyzed in both Fall 2018 and Spring 2019 semester, and, in particular, attention was paid to how students did with regards to General Education learning objectives.

Based on the results of this analysis and on the observations of the faculty teaching the course, the course was substantially revised over the Summer 2019. The number of topics taught in the course was substantially reduced to free up class time for active learning activities designed to teach students problem-solving skills, to deepen students' conceptual understanding of the material and to strengthen their critical thinking skills. Problem-solving assignments have been developed for both in and out of class use.

Thanks to the UNC Systems Office grant, we have been able to hire 8 Learning Assistants for 3 sections of Math 1064 in the Fall 2019 semester and 9 Learning Assistants for 3 sections in the Spring 2020 semester. Learning Assistants are undergraduate students who have completed the course previously and who participate in active learning activities both in and out of class, engaging with students and helping them navigate challenging assignments and activities. Learning Assistants are taking a one-hour pedagogy course and meet with the faculty for one hour each week. Additionally, students in sections supported by Learning Assistants have been offered recitations sessions for 3 hours a week taught by faculty and Learning Assistants.

This semester (Fall 2019), we are planning another detailed study of students' performance on the final exam with GE learning outcomes mapped to specific problems/questions on the final exam, as well as a comparative study of students' performance in sections supported by Learning Assistants versus in regular sections.