HIGHER LEARNING COMMISSION

FORM

Open Pathway Quality Initiative Report

Institutional Template

The enclosed Quality Initiative Report represents the work that the institution has undertaken to fulfill the Improvement Process of the Open Pathway.

Lana Reynolds 4-22-19

Signature of Institution's President or Chancellor *Date*

Lana Reynolds, President

Printed/Typed Name and Title

Seminole State College

Name of Institution

Seminole, OK

City and State

The institution uses the template below to complete its Quality Initiative Report. The institution may include a report it has prepared for other purposes if it addresses many of the questions below and replaces portions of the narrative in the template. This template may be used both for reports on initiatives that have been completed and for initiatives that will continue and for which this report serves as a milestone of accomplishments thus far. The complete report should be no more than 6,000 words.

Quality Initiative Reports are to be submitted by August 31 of Year 9. HLC recommends that institutions with comprehensive evaluations in the first half of Year 10 submit their report at least six months prior to their Assurance System lock date. Submit the report as a PDF file to pathways@hlcommission.org with a file name that follows this format: QI Report No Name University MN. The file name must include the institution's name (or an identifiable portion thereof) and state.

Date: 2 April 2019

Contact Person for Report: Jessica Isaacs, Coordinator of Accreditation

Contact Person's Email Address: j.isaacs@sscok.edu

Report Categories

Overview of the Quality Initiative

1. Provide a one-page executive summary that describes the Quality Initiative, summarizes what was accomplished and explains any changes made to the initiative over the time period.

Seminole State College's Quality Initiative is "Math Pathways and Co-requisite Math Remediation." This project is a redesign of SSC's mathematics remediation curriculum, replacing three levels of remedial math courses (Basic Algebra, Elementary Algebra, and Intermediate Algebra) with campus-wide, at-scale co-requisite math remediation based on students' degree programs. This redesign correlates with state and national efforts to modify existing mathematics education for increased appropriateness and transferability for all students as well as to increase degree completion and course relevance for students needing math remediation. This QI is informed by the larger efforts of Oklahoma State Regents for Higher Education's Math Pathways Task Force and Complete College America to reassess the appropriateness of current mathematics education requirements for different degree programs and provide multiple, more relevant, gateway college-level math options.

The "Math Pathways" component of this QI resulted in the replacement of two gateway courses (College Algebra and Math in Society) with four college-level, degree-program-relevant gateway math courses. Each of these four redesigned math pathways provides co-requisite remediation for those students requiring it, thus allowing for at-scale implementation. In keeping with Oklahoma's state-wide trend, SSC's new math pathways are the Quantitative Reasoning Pathway (MATH 1413 Quantitative Reasoning), Elementary Statistics Pathway (MATH 1503 Elementary Statistics), Pre-Calculus for Engineering / Physics / Computer Science Pathway (MATH 1513 Pre-Calculus for Engineering, Physics, and Computer Science), and Pre-Calculus for Business / Biology Pathway (MATH 1523 Pre-Calculus for Business and Biology).

The focus of the "Co-requisite Math Remediation" component of the QI was to increase the completion rate in gateway math courses by entering students requiring math remediation. Specifically, the goal is to increase the retention and graduation rates for this population of students in the college-level course with the remediation co-requisite, which comprises more than 65% of SSC's entering students.

"Math Pathways and Co-requisite Math Remediation" is a continuation of work begun in 2011-13 of redesigning developmental education at the college. The Math Pathways aspect of this QI aligns with another campus-wide project, SSC's *Engagement, Completion, and Success Initiative*.

No significant changes have been made to the QI since its implementation.

Scope and Impact of the Initiative

2. Explain in more detail what was accomplished in the Quality Initiative in relation to its purposes and goals. (If applicable, explain the initiative's hypotheses and findings.)

QI Goals and Hypotheses:

The primary goal of SSC's Quality Initiative was to increase the rate at which developmental students complete their gateway math courses in their first year of attendance, and as a result, increase retention and graduation rates for these students. A parallel goal was to make required math courses more applicable and relevant to specific degree programs. To this end, SSC defined the following purposes for the QI based on identified challenge areas:

- Create and implement multiple, appropriate Math Pathways gateway courses based on degree programs – STATUS: ACHIEVED
- Update entry-level math placement processes – STATUS: ACHIEVED
- Add supplemental instruction / corresponding math co-requisite remediation courses for each new Math Pathway for students requiring math remediation – STATUS: ACHIEVED
- Establish an optimistic and realistic goal timeline for incremental improvement of college-level math course completion rates for students requiring math remediation (when 2016-2017 completion data is available) – STATUS: IN PROGRESS
- Increase retention and completion rates of students successfully completing college-level gateway math courses – STATUS: ONGOING
- Increase the completion rate in gateway math courses by entering students requiring math remediation, thereby increasing retention and graduation rates for this population of students which comprises more than 65% of SSC's entering students – STATUS: ONGOING
- Establish appropriate benchmark goals and tracking procedures for general education math relative to retention and completion – STATUS: QI DATA TRACKING TABLE CREATED / COHORTS IDENTIFIED / DATA COLLECTION – ONGOING

The philosophy guiding this QI is that by reflecting current national and statewide academic trends in redesigning traditional mathematics education and remediation, SSC provides students with more possibilities of persisting in college on to graduation, thereby having more opportunity for overall academic and personal success. This philosophy coincides with the shared national and statewide goals of Complete College America, the Dana Center, and Oklahoma State Regents for Higher Education's (OSRHE) math education redesign efforts. The Mathematics Pathways to Completion (MPC) from the Dana Center states: "Each state has a customized plan and time, [and] consulting, tools, and services to support each phase. [The phases are:] Phase 1: Build urgency and intrinsic motivation for change, Phase 2: Enable scale by creating the policy and practice conditions for statewide implementation, [and] Phase 3: Enact the MPC at institutions by building faculty and institutional capacity." Goals of the Oklahoma Math Pathways Task Force are: transferability across institutions, [and to] provide faculty and advisor professional development and resources" ("How the MPC Works" https://dcmathpathways.org/where-we-work/mathematics-pathways-completion-mpc).

The premise behind these state and national initiatives is that while most students at a two-year college expect to transfer to a four-year university and graduate, very few do. However, when students see clear connections between the course and their overall academic field of study and professional goals, they more readily understand how to apply and use math concepts. This understanding leads students to spend less time in remediation, which directly results in higher chances for success, overall completion of their associates degrees, and transfer to baccalaureate-granting institutions.

The Dana Center explains this disconnect as "the missing piece" between transfer and applicability. Nationally, students lose several credits upon transfer, which discourages them and hinders their progress, many times derailing them altogether. Information presented at the Dana Center Mathematics Pathways Oklahoma Transfer and Applicability Working Group Launch Meeting led by Rey Garcia and Carl Kreuger on March 21, 2017 showed that of 95,932 Oklahoma community college students who were enrolled in public institutions in the fall of 2015, only 3,173 transferred from two-year to four-year institutions. The Dana Center's Mathematics Pathways initiative is designed to ensure applicability and transferability, which is also the emphasis of SSC's "Math Pathways and Co-requisite Math Remediation" Quality Initiative.

QI Findings:

SSC's Annual Course Embedded Assessment Procedures have been instrumental in helping to track the overall success of this QI. Discussions have focused on comparing the results from SSC's 2013 redesign of the developmental education program to its current state, analyzing student performance for remedial course completion, college-level math completion, and graduation for students who entered SSC and required math remediation between 2009 and 2016. The cohort of developmental math students entering from fall 2009 through spring 2012 served as the baseline cohort for evaluation of the 2013 redesign of SSC's developmental education. The year 2012-13 was a transition year, so no data was reported for that year. Data for college-level math completion for each cohort since the curriculum redesign continues to be collected and updated for a period of six years from the point of entry after which time the data becomes fixed. Therefore, college-level course completion data for all cohorts are still subject to increase within the six-year window used. Data from all cohorts are currently in the process of being analyzed.

2013 Redesign:

The result of the 2013 redesign of SSC developmental education showed the college-level math course completion rate improved each year. The 2015-16 cohort experienced similar success to the previous cohorts as proven by their performance in 2016-17. It is anticipated that accumulation of fixed six-year graduation data for all of these cohorts should show improvement as well in time.

QI Redesign:

The evaluation of the 2013 redesign of SSC's developmental education program used a six-year student performance window for the completion of college-level math. Due to the importance of students completing college-level math in their first year, the QI evaluation efforts use a two-semester student performance window for the completion of college-level math by developmental students. Two semesters are used instead of one year in order to accommodate students who are unable to take math their first semester. Due to the co-requisite remediation model which gives all students the ability to take math their first semester, some students will be advised to take it their second semester in order to balance as much as possible enrollment in math classes in fall and spring semesters. Students will enter their cohort the first semester they take math, be it fall or spring of their first year. From there, they are tracked for completion of college-level math in their first two semesters since they began taking a math class.

To facilitate the tracking of this data, SSC has established two cohorts of developmental math students. The before or "baseline cohort" consists of all students who placed into the previous developmental math sequence over the three-year period immediately preceding this QI. In so doing, this cohort contains students who entered math developmental education prior to SSC scaling co-requisite remediation to a campus-wide level as part of this project.

The after, or "QI cohorts" are the students who placed into co-requisite math remediation each year since the inception of the QI in fall 2017, thus encompassing the same segment of the student population as the baseline cohort. Two data points are tracked annually for each cohort:

1. Completion of gateway math course in two semesters of math enrollment, and
2. Graduation with six years (300%) of normal time) to collectively evaluate full- and part-time student populations.

Additionally, the "QI" cohorts are subdivided into separate sub-cohorts based on the math pathway taken.

While SSC is aware the six-year graduation rate data falls outside the timeframe of the QI, the data collection is mandated by broader assessments and initiatives already in place at the college. As the data for completion of college-level math courses for students requiring remediation is compiled each year, the QI team will continue to assess the incremental improvements to college-level course completion rates for those cohorts of students.

In addition to these activities, SSC is gathering and evaluating parallel data and goals for non-developmental students for completion of college-level gateway math courses in the first year as well as graduation within six years. SSC uses the QI Data Table it developed as the tool for tracking this data. The QI Data Table is used to compile data for:

1. The completion of a college-level math course in the first two semesters of enrollment, and
2. The six-year graduation rate for

    A) Entering Developmental Math Students – Baseline Cohort and QI Cohort, and

    B) Entering Non-Developmental Math Students – Baseline Cohort and QI Cohort.

Regular training, professional development, and meetings of the key individuals and groups involved in the QI to discuss accomplishments and challenges of the initiative have enabled prompt identification of problem areas and corrective adjustments to the curriculum or other aspects. Regular across-the-campus training of all advisors and student services personnel involved in admissions, enrollment, and advising students has also served as an important feedback loop helpful in identifying potential problem areas and ways to improve when necessary.

SSC's ongoing participation in state and national conferences and meetings regarding mathematic pathways redesign has been critical to the smooth implementation, evaluation, and necessary adjustments of the QI. Continuing discourse with other colleges and universities per SSC's 2+2 transfer agreements with various transfer institutions as well as the Oklahoma State Regents for Higher Education's Course Equivalency Project will likewise provide direction for any assessment of the initiative's success or need for re-adjustment.

The QI Team in collaboration with the SSC Assessment of Student Learning Committee worked together to establish articulated goals for successful math remediation rates for each year of the initiative and examined trends in Oklahoma's high school math remediation efforts as part of that goal-setting process. Currently, Oklahoma high schools are being encouraged to remediate during the senior year as part of the state's overall mathematics redesign efforts. Motivated high school students will take this opportunity more each year as word spreads and each high school offers the opportunity for math remediation and preparation for college-level math courses. Tracking first-year success in college-level math courses will inform these ongoing efforts.

The 2017-2018 Assessment Data collected for the SSC Transitional Education Report shows that the percentage of students successfully completing college-level math gateway courses is 75.5% with the creation of the co-requisite model of remediation. This data contrasts to the peak number of students who completed the college-level gateway courses following the first curriculum redesign, which peaked at 47.2% in 2014-2015, compared to 27.2% for the baseline cohort.

To compare student performance before and after both curriculum redesigns, all students entering the SSC mathematics developmental program for the first time between fall 2009 and spring 2012 were placed into a pre-redesign baseline cohort, regardless of their point of entry into the three-course developmental sequence in use at the time. While the year 2012-2013 was a transition year and no data was collected for that year, the curriculum redesign was encouraged by OSRHE and state and national trends that were already in progress. The peak percentage of students who completed math remediation following the first curriculum redesign was 55.7% compared to 35.4% in the baseline cohort. Since the full implementation of the co-requisite model in 2017, that percentage increased to 75.5%.

As a result of the first redesign, the graduation rate increased for this particular cohort of students, to 29.1% being the highest rate of remedial math students persisting on to graduation in 2013-2014. After the QI Redesign, a projection of double that percentage of students are expected to complete their degrees by 2020-2021, as efforts continue to track and collect data. Logic allows that with more time and greater percentages of students completing math remediation and college-level math courses, this graduation rate will increase as well.

Indeed, the graduation rates for the students successfully completing the transitional math co-requisite course is forecast to increase significantly, based on past SSC trends for remedial math students persisting on to graduation. For example, before the co-requisite model, the 2013-2014 cohort of transitional math students had a three-year graduation rate of 29.1% compared to 17.7% in the baseline cohort from 2009-2012, which had six years to graduate. Therefore, it stands to reason that as students complete their college-level math courses and graduate in subsequent years, the long-term completion rates should improve incrementally.

The percentage of all students, not just transitional, who complete the general education mathematics education in one year increased to 80.8% in 2017-2018 with the implementation of the co-requisite model, compared to the highest previous rate of 64% in 2014-2015 before the co-requisite model – a 16.8% increase overall. Thus, the likelihood for these students graduating from SSC in two years is also increased.

Overall, preliminary results are promising. Rates for the completion of remedial and college-level math are expected to continue to increase. Quicker completion of math remediation and college-level math courses is expected to continue to have a positive effect on graduation rates as well. The new math pathways should significantly increase these graduation rates. In fact, based on the observed 6.75% yearly increase, which comes from the five-year span from 2009-2014, the prediction for the 2017-2018 cohort is to reach or exceed 40.5% by 2020. Faculty and administration support this plan that the cohort will demonstrate a marked increase in graduation rates over the next two years.

3. Evaluate the impact of the initiative, including any changes in processes, policies, technology, curricula, programs, student learning and success that are now in place in consequence of the initiative.

The impacts of the QI are most clearly represented by its assessment data (detailed in section #2 of this report), which show a significant increase in student learning and success, not only in the math remediation courses, but also in student persistence and completion trends across all college programs.

The college has changed the math curricular requirement in every degree program to be more reflective of the type of math pathway students need as most relevant for that academic discipline and career field. The following list details these changes:

- Degree programs / majors requiring Quantitative Reasoning Math Pathway (MATH 1413): Art; Child Development; Elementary Education; Secondary Education with English or History Emphasis; Language Arts; Health, Physical Education & Recreation; Business Technology *(required remediation, depending on placement cut scores, is MATH 1413 with MATH 0203 co-requisite)*
- Degree programs / majors requiring Elementary Statistics Math Pathway (MATH 1503): Agriculture; Health Sciences; Nursing; Social Sciences; Psychology; Physical Therapist Assistant *(required remediation, depending on placement cut scores, is MATH 1503 with MATH 0223 co-requisite)*
- Degree programs / majors requiring Pre-Calculus Math Pathway (for Business and Biology) (MATH 1523): Biology; Business; Medical Lab Tech; Secondary Education – Biology Emphasis; *(required remediation, depending on placement cut scores, is MATH 1523 with MATH 0243 co-requisite)*
- Degree programs / majors requiring Pre-Calculus Math Pathway (for Engineering, Computer Science and Physics) (MATH 1513): Computer Science; Pre-Engineering; Liberal Studies – Math and Physical Sciences Emphases; Secondary Education – Math and Physics Emphases *(required remediation, depending on placement cut scores, is MATH 1513 with MATH 0243 co-requisite)*

These updated degree programs and their corresponding degree program checklists are posted on the SSC Website and easily accessible for students, as well as published in the SSC Course Catalog. The new course descriptions and degree program changes have gone through the SSC Curriculum Committee and have received Administrative Council approval prior to being added to the Catalog and SSC's inventory of course offerings. The new math pathway courses are included as well on the OSRHE Course Equivalency Project state transfer matrix.

Additionally, SSC's math placement testing procedures have changed to accommodate the new math pathways and co-requisite remediation needs. High school counselors and administrators have also been informed of the new math pathways and placement procedures, and are kept up-to-date with the changes via ongoing communication at the college and state level.

Enrollment advisors for both new and returning students, as well as all faculty and staff, have had training in identifying which math pathway to place students into through in-service presentations, special advisor training workshops, regular email updates, and special Faculty Senate and divisional and staff meetings.

Students are made aware of the new math pathways, too. As part of SSC's Learning Strategies course, which is required for all first-year students, the students create a "transfer portfolio," which includes their degree plan for completion at SSC as well as a degree plan for their targeted transfer university once they complete their associate's degrees at SSC. Students are therefore made aware of their general education math requirement for their particular degree program, further showing the change in SSC's campus culture of a new understanding of the applicability and relevancy of the new math pathways for the different degree programs. Beginning in 2019 in collaboration with the OSRHE, the Oklahoma State Department of Education is requiring high school students in the ninth grade to choose career plans which will further help students to identify the appropriate math pathway for their degrees.

4. Explain any tools, data or other information that resulted from the work of the initiative.

The Assessment Coordinator and QI Math Faculty created a data tracking tool, the QI Data Table*, to facilitate the collection and analysis of data for each of the cohorts affected by the initiative:

QI Data Table	Entering Developmental Math Students Peak Performance			All Entering Math Students Peak Performance		
	Baseline Cohort	1st Redesign Cohorts	QI Cohort(s)	Baseline Cohort	1st Redesign Cohorts	QI Cohort(s)
(1) Completion of College-Level Math	27.2%	47.2%	75.5%	45.9%	64%	80.8%
(2) Six-Year Graduation Rate**	17.7%	29.1%	In progress	22.9%	33.7%	In progress

**The assessment data that has been collected thus far from the initiative is detailed in section #2 of this report.*

***At the time of this report, the QI Cohort redesign group has been in place less than two years, so we do not yet have complete graduation rates for that cohort. However, after one year, the QI Cohort has a*

graduation rate of 2.3% for the entering Developmental Math Students and 2.9% for All Entering Math Students.

To facilitate the ease of enrollment and understanding of the new math pathways in each degree program, Academic Affairs created and posted to the SSC Website the "Math Pathways Degree Clusters Graphic" and the "Math Pathways Placement Cut Scores Enrollment Chart" (http://www.sscok.edu/Assessment/Placement%20Test%20Cut%20Scores%202018%2008%2014.pdf).

These tools show each new math pathway course, which degree programs require that course, and the revised placement cut scores and required co-requisite courses for remediation for each math pathway.

All advisors and other pertinent faculty and staff, including Admissions personnel and Testing Center personnel, are trained in the application of this flow chart in proper placement and enrollment of students.

All of the degree program checklists have been updated as well to help advisors and students in planning their course of study and semester enrollments with the new math pathways. These degree checklists are also posted on the SSC Website: http://www.sscok.edu/schedule/Academics/AcadPgDegee.html .

5. Describe the biggest challenges and opportunities encountered in implementing the initiative.

Implementation Challenges:

The first semester of implementation was difficult as the college transitioned to the new pathways. Planning lessons in the new curriculum, supporting students in the transition, and adapting to the new schedule required an extraordinary amount of effort and patience. However, the results of the change began to be apparent in the second semester as students, advisors, and instructors settled into the new system.

Some overall confusion has occurred regarding which math pathway will count if a student decides to change majors. For instance, Elementary Statistics or either Pre-Calculus course can replace Quantitative Reasoning, but not the other way around. Pre-Calculus for Engineering / Computer Science / Physics can replace the other Pre-Calculus course for Business / Biology, but neither of these courses can replace the Elementary Statistics, nor can Elementary Statistics replace Pre-Calculus.

Students need to have a good idea of what they want to do when they come in to enroll to ensure they are placed on the correct pathway. Unfortunately, this may not always be the case. Students may choose a major that their peers are majoring in, sounds fancy, or makes the most money. The appreciative advising model is in place at SSC as part of the college's Student Success Initiative, but it may not be practiced consistently, due to time restraints and understaffing. One of the challenges with the pathways is that students are forced very quickly to choose a degree. Whereas College Algebra (before the Math Pathways redesign) was a default choice and would go toward basically any degree program, now if a student changes majors, they may have to take another general education math course to fulfill the requirements for their new major. This could cause time and financial concerns for the student. If a student is uncertain about a major, then that student should be encouraged to wait until the second semester to take the math course in an effort to more appropriately place the student into the correct Math Pathway.

Creating a list of "red flags" to watch for would help advisors in placing the students into math appropriately. For instance, if a student states they have never had algebra at all before coming to college, this student should visit with a mathematics professor about which course to take. If a student fails a math course, the student should consult with a math professor before being placed into another course.

Some improvements still need to be made on the advising side to help with proper placement of students and scheduling. Classes become overfilled in the fall which results in concerns about making

full schedules in the spring. Therefore, a process needs to be put in place to have some students wait until the spring semester to take math, which has been a difficult transition. Additionally, some students are "missed" and haven't taken a math course within their first two semesters.

Faculty scheduling concerns pose another challenge area. When the co-requisite is taught by a different instructor than the gateway math class, issues may arise regarding consistency of instruction and delivery style. These issues may cause some unnecessary confusion for already struggling remedial students. Logistically speaking, however, this issue may not be avoidable at this particular time, due to college budget and staffing constraints. With time, these advising / scheduling issues should become less and less.

Certain growing pains are to be expected when considering all the changes to the math pathways and their corresponding degree programs, especially as regarding enrollment and advising. Time is simply needed for complete institutional change and understanding. Many emails, conversations, and training meetings among multiple constituents of the college will continue to help facilitate this campus-wide understanding of the math curriculum redesign.

Implementation Opportunities:

Despite these "red flags" and minor implementation challenges, the success of the Math Pathways and their co-requisites has given students a fantastic opportunity to complete their degrees in a timely manner. The philosophy and practice of co-requisites is a logical solution for removing the delay in students completing required math remediation as well as for students enrolling in science courses, which may require a math prerequisite.

The co-requisite model also provides the instructors more opportunities to help scaffold some of the basic math skills (fractions, decimals, ratios, etc.) that students will need in numerous courses in the future. Though the co-requisites may often be challenging to manage and can be time consuming, the various pathways create a unique opportunity to tailor authentic experiences to specific majors and help students see validity in their investment in the course.

In this way, the QI connects with SSC's planning processes which emphasize meeting the identified functions of the college, providing remediation for students in our service area, helping students to achieve completion of their associates degrees, and encouraging them to transfer to finish their bachelors degrees.

Commitment to and Engagement in the Quality Initiative

6. Describe the individuals and groups involved at stages throughout the initiative and their perceptions of its worth and impact.

The key people involved in the Quality Initiative have been the full-time math faculty, Dr. Linda Goeller, Emily Carpenter, Melissa Bryant, and Lynette Gomez. These four individuals have been involved in the QI since its inception.

Other members of the QI Team include Dr. Tom Mills, Vice President for Academic Affairs, Tammy Madden, Director of Advisement, Sheila Morris, Registrar, Tina Jones, Testing Center / Placement Testing, Robbie Lindsey, IT, and Jason Cook, STEM Division Chair.

Perceptions of Worth and Impact:

The full-time math faculty have met regularly to discuss the progress of the QI, as well as their perceptions of its worth and impact, which are detailed in the following paragraphs:

- With all the general education courses that students must take their first few semesters, it is a great benefit that their math course is one of the most relevant. With the new Math Pathways, students are accessing mathematics skills that are relevant to their majors. This is surprising and often refreshing for many students, especially those who are taking Elementary Statistics and have no idea what to expect.

- The co-requisite course aligns with what research about inclusion has been spelling out for almost two decades. With an organized support system in place, students of varying abilities and prior knowledge can be successful. The co-requisites have been a lifesaver for many students, who simply would not have passed their college-level math class without it.

- Co-requisites bring a wonderful layer of diversity to the classroom. The enthusiasm that a student experiencing success for the first time in a math class brings is infectious and often seems to "catch" with some of the other average-achieving students that maybe previously had a stale appreciation for the content. Co-requisites make math feel so much more equitable for all students.

- Knowledgeable and invested faculty are key to making the co-requisite model work. The Math Pathways with the co-requisites work amazingly well when they are taught by excellent instructors, who share support and ideas with one another on an ongoing basis.

- In the past, it has often been difficult to explain to students why they need College Algebra. While Algebra is certainly useful for strengthening the ability to think rationally, many other forms of math can be used for teaching rational thinking. These new math pathways provide more avenues for this kind of learning. Statistics, for instance, is the perfect course for pointing out ways that numbers can be used to sway opinions. Students immediately see the "real-world" applicability of the course material when looking at fallacies in research data and critiquing statistics in research articles. Faculty report that their students in classes like Statistics have been far more successful than the students were in College Algebra before the new pathways.

- The outdated belief that all students need College Algebra is absurd and is a big reason why many students in the past were unable to finish their degrees. Changing to a co-requisite model brings SSC up-to-date with the latest and most relevant math curriculum changes in the state and nation, and it leads directly to improved student success, retention, and completion of their degrees. The fact that the developmental students are getting through their general ed math requirement in one semester instead of three or even four is a tremendous benefit that has played a critical role in increasing retention rates.

- The QI has certainly already increased the rate at which developmental students complete their gateway math courses in their first year of attendance, which will continue to directly result in positive impacts to SSC's retention and graduation rates over time. The changes have helped general student success tremendously.

7. Describe the most important points learned by those involved in the initiative.

The new Math Pathways create more relevance of math to the students' degrees. The pathways encourage student persistence and completion because students can readily see the applicability of the course matter.

The QI helps students make connections among mathematics education and their other courses and academic experiences by achieving better relevance of math education to different areas of study and more "real-world" applications within the different degree programs than the traditional college algebra course facilitates.

Students are prepared to use mathematic and quantitative reasoning skills in their careers and personal lives. Students are empowered as mathematical learners and enabled to make timely progress toward the completion of their degrees. More expedient progression through the general education math requirement means better student motivation and persistence overall.

Resource Provision

8. Explain the human, financial, physical and technological resources that supported the initiative.

Human Resources:

SSC has committed one Division Chair, the Coordinator of Assessment, an Assessment Assistant, four full-time math professors, one placement testing employee, a Registrar, a Director of Advisement, and a Vice President for Academic Affairs to the implementation of the QI, in addition to math faculty, math tutors, several admissions staff, enrollment advisors, and Student Services personnel.

Financial Resources:

SSC has committed financial resources to the implementation of the QI by way of providing professional development funding for the math faculty to attend Math Pathways meetings and trainings, and updating the math placement procedures and course catalog and degree program descriptions and checklists. SSC has provided training for the admissions staff and enrollment advisors about the new math pathways, as well.

Technological Resources:

SSC's IT and Academic Affairs personnel have been uploading the changes to the course catalog and all the degree programs on the SSC website. Changes to the data management systems for course inventory, admissions requirements, placement, registration and enrollment have also been implemented.

Physical Resources:

The STEM Division has a designated Math Computer Lab with software programs and tutors available to assist students. Various classrooms or conference rooms may be reserved for regular QI meetings to continually assess and reassess the progress of the initiative.

Plans for the Future (or Future Milestones of a Continuing Initiative)

9. Describe plans for ongoing work related to or as a result of the initiative.

Assessment data shows success thus far, and continued success is expected. The projected goal is to try to achieve 100% of students enrolled in college-level math in their first year.

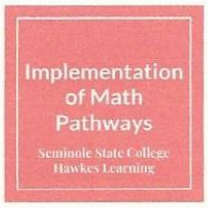
The QI Team will continue to assess and track the data and refine the curriculum and teaching strategies as needed. They will continue to educate the campus community about the project, as part of the continued "culture shift" in promoting understanding and engagement with the QI.

10. Describe any practices or artifacts from the initiative that other institutions might find meaningful or useful and please indicate if you would be willing to share this information.

Throughout the Quality Initiative process, we have realized that garnering 100% "buy-in" from faculty and administration has been key to the project's success.

The core math faculty involved in the QI have presented their work in redesigning SSC's math curriculum at several conferences and meetings, in an effort to share our experiences with this project with other institutions.

Math professors Dr. Linda Goeller, Melissa Bryant, Emily Carpenter, and Lynette Gomez presented "Implementing Co-requisites to Support Math Pathways" at the Innovative Educators Summit, hosted by Hawkes Learning on March 3, 2018. Hawkes Learning used information from the SSC Math Faculty's presentation to create a "Case Study" to share with other educators. The group was invited to present again at the March 2, 2019 Innovative Educators Summit, and they created a webinar for Hawkes that will be available nationwide. The Case Study can be found here: https://docs.google.com/presentation/d/1umLkNCZ-8LIcOlT8oYlV8nz2zU28Ulq1v84dXTMNrgo/edit?usp=sharing .



Case study

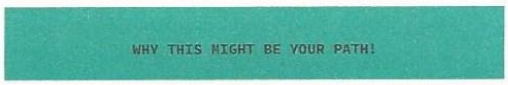
docs.google.com

Implementation of Math Pathways Seminole State College Hawkes Conference I Have, Who Has

The webinar, "Implementing Co-requisites to Support Math Pathways," is available here: https://hawkeslearning.zoom.us/webinar/register/WN_DK8EQPnZQx64mAtAFyFP_Q

Emily Carpenter, Assistant Professor of Mathematics and Director of Transitional Mathematics and Kendall Rogers, Assistant Professor of Psychology and Student Success Coordinator presented "Successful Students: At the Heart of Our School's Evolution" at the Ruffalo Noel Levitz National Conference, July 25, 2018.

Emily Carpenter and Dr. Linda Goeller presented about STEM Degrees and SSC's Math Pathways at Gordon Cooper Technology Center's STEM Day. That presentation may be accessed here: https://docs.google.com/presentation/d/1RBlCxGuzbjJAcRbBnnBf6thcBThucxqLF2Q8fEp3LfI/edit?usp=sharing



GCTC STEM Present

docs.google.com

STEM Degrees WHY THIS MIGHT BE YOUR PATH!

Dr. Linda Goeller has also presented at two OSRHE Counselors Retreats about the Pathways. All of her involvement has led to an opportunity for her to serve on a statewide task force to create a better path for students from high school to college.

Dr. Tom Mills, Vice President for Academic Affairs, has visited with over 20 area high schools' principals and counselors about the rationale behind the new Math Pathways.

Dr. Mills has created the Degree Cluster Graphic below, which may be shared with other institutions as an informational tool.

Find Your Pathway to a Degree at SSC!

Seminole State College offers two-year associate in science (AS) and associate in arts (AA) degrees for students planning to transfer to a four-year college or university and associate in applied science (AAS) degrees for students intending to enter directly into the work force upon graduation. Students should enroll in the general education math course relevant to their major. Each degree program has a faculty member who serves as a Degree Program Mentor. Call the Academic Division or click on *Academics* on the SSC website for contact information for the mentor specific to a program of interest.

Quantitative Reasoning Math Pathway (MATH 1413)

Major	Academic Division
Art AA	LAH
Business Technology AAS	BE
Child Development AA	BE
Criminal Justice AS	SS
Elementary Education AS	BE
Health, Phys Education, and Recreation AS	BE
Liberal Studies AA – English Emphasis	LAH
Liberal Studies AA – Language Arts Emphasis	LAH
Liberal Studies AA – Speech Emphasis	LAH
Secondary Education AS– English Emphasis	BE
Secondary Education AS – History Emphasis	BE

Elementary Statistics Math Pathway (MATH 1503)

Major	Academic Division
Agriculture AS	STEM
Health Sciences AS[2,3]	HS
Liberal Studies AA[4]	LAH
Psychology AS[5]	SS
Social Sciences AA	SS
Social Sciences AA - Govt./History Emphasis	SS
Social Sciences AA - Sociology Emphasis	SS

Pre-Calculus for Bus-Biol Math Pathway (MATH 1523)

Major	Academic Division
Biology AS[6]	STEM
Business AS[6]	BE
Medical Lab Technology AAS	HS
Secondary Education AS - Biology Emphasis	BE

Pre-Calculus for Eng-Phys-CS Math Pathway[1] (MATH 1513)

Major	Academic Division
Computer Science AS	STEM
Liberal Studies AA - Math Emphasis	LAH
Liberal Studies AA- Physical Sciences Emphasis	LAH
Pre-Engineering AS	STEM
Secondary Education AS – Chemistry Emphasis	BE
Secondary Education AS - Math Emphasis	BE
Secondary Education AS- Physics Emphasis	BE

[1] After completing Math 1513 Pre-Calculus for Eng-Phys-CS, students planning to transfer should enroll in MATH 1613 Trigonometry followed by Calculus and Analytic Geometry I-III.

[2] Health Sciences - MLT Emphasis students are recommended to take MATH 1523 Pre-Calculus for Bus-Biol.

[3] Health Sciences – Nursing Emphasis students planning to pursue a four-year BSN degree should refer to the math pathway requirement of the institution to which they plan to transfer.

[4] The appropriate math pathway for Liberal Studies majors will depend on the chosen area of study at transfer institution.

[5] Psychology majors transferring to OU should take MATH 1523 Pre-Calculus for Bus-Biol.

[6] To facilitate transfer of MATH credits, Biology and Business majors should enroll in MATH 2213 Calculus for Bus-Biol as a Major Field Elective after completing Math 1523 Pre-Calculus for Bus-Biol.

SSC Student Services

Admissions Office	405-382-9230
Business Office	405-382-9538
Distance Education Proctoring Center	405-382-9243
Financial Aid Office	405-382-9247
Testing Center	405-382-9576

SSC Academic Divisions

BE	Business and Education	405-382-9252
HS	Health Sciences	405-382-9205
LAH	Language Arts and Humanities	405-382-9561
STEM	Science, Technology, Engineering, and Mathematics	405-382-9266
SS	Social Sciences	405-382-9554

Revised 3/29/2018