

Description

Please provide a description of the Effective Practice.

SNHU's Pathways to Math Success is an initiative that encompasses the generation of new math courses and program redevelopment (Quantitative Analysis, also known as College Algebra, and Precalculus) along with an online assessment (ALEKS PPL) that determines students' level of math preparedness. The assessment helps to align student preparedness with their first online math course and determines if prior math experience can be credited. Data analysis indicated that many students were not prepared for their first math course, which was originally Calculus I (MAT 225) prior to the Pathways to Math Success initiative. Additionally, many of these adult learners had significant gaps in math knowledge due to extended time out of school. The Pathways to Math Success initiative helped address the inconsistencies between students who were prepared for Calculus I and those that needed additional support to gain or refresh math skills.

The initiative, launched in 2017, enables students in eligible programs to gauge their math skills and earn up to six credits toward their degrees for demonstrating knowledge required in specific math courses through the ALEKS PPL assessment. Information about the initiative is readily available to prospective and existing students through the SNHU website, (please see Image 1 in the supplemental materials.), and through admissions counselors and academic advisors trained to discuss the assessment and placement with students. (Please see Example 1.)

Prior to the launch of Pathways to Math Success, online students transitioning from general coursework to program-level studies all enrolled in Calculus I. Collectively, across majors, students at the undergraduate level struggled and failed to persist in their transition because they were not successful in the Calculus I course. This became a roadblock to student success. The STEM department recognized the need for aligning course placement with student preparedness to improve success while also providing credit for demonstrated mastery through the ALEKS PPL math assessment. Collaboration within the university, across departments and with external partners led to the development of this new initiative, Pathways to Math Success, to meet the unique needs of online learners. Comprehensively, this initiative involved:

- the redevelopment of programs to include the addition of two math courses (College Algebra and Precalculus);
- the alignment of the ALEKS PPL as a Prior Learning Assessment (PLA) for both accurate math placement and credit;
- university scholarship of this assessment for students in the pilot phase;
- and comprehensive support and guidance for students throughout the university. This comprehensive university-wide effort to support this initiative included the active involvement of the Registrar, IT, Marketing, Office of Accessibility, Student Financial Services, Admissions, Advising, Academics, and Learning Resources.

Learning Effectiveness

Please describe how the practice demonstrates effectiveness in producing learning outcomes, which are consistent with learner needs and representative of the distinctive quality of the institution. 500 word limit.

SNHU's Pathways to Math Success addresses the needs of individual learners and improves student success by expanding the math progression to align with prior math education, especially for adult and nontraditional learners. By providing a smooth progression, SNHU helps scaffold math learning for students. What was once an exceptionally difficult transition from general first-year coursework to program-specific math (Calculus I), has been reshaped by the addition of College Algebra and Precalculus coursework. Pathways to Math Success also offered a non-credit bearing course, (MAT 010) in the pilot phase, to ease student anxiety and prepare them to take the assessment as many older and nontraditional students lack recent exposure to math. Content from MAT 010 has, in large part, been made available on SNHU's internal student portal (Please see Image 2.) to support students participating beyond the pilot phase.

Since this initiative was launched in 2017:

- Student success in Calculus 1 (MAT 225) has consistently risen as illustrated in the supporting document.
- More than 1,000 students have earned credit for one or more math courses.
- Over 1,500 courses have been waived and credited, resulting in more than \$1.8 million in tuition savings for students.
- The program has expanded to accommodate students with prior knowledge in statistics.
- Currently, SNHU students in 15 STEM and Social Sciences programs can earn credit for prior math knowledge and be placed in a math course that will best prepare them for success in their program-level courses.

An additional outcome of the pilot phase of this initiative is that SNHU learned, through the ALEKS PPL, that the vast majority of students placed into College Algebra, which demonstrated that this Pathway to Math Success was both needed and necessary to support student learning.

Of the over 3,200 students who took the assessment in pilot, 59% earned a score that would place them in Quantitative Analysis (College Algebra), 23% earned a score that would place them in Precalculus, and only 18% earned a score that would have them start in Calculus I. This illustrates that Calculus I was not the best fit for our learners' first math course.

Scale

Please describe how the practice offers the best possible educational value to learners and supports achieving capacity enrollment. 500 word limit.

With more than 130,000 online learners, SNHU builds everything to scale. Many learners in SNHU's core student population, adult and nontraditional students, enroll with diverse experiences and varying math skills. SNHU seeks to provide all learners with a smooth transition into their program-level courses. Recognizing a need for math progression that prepares students for success in their program-level math courses, SNHU developed Pathways to Math Success to provide educational value to students and support their success.

Since the introduction of the Pathways to Math Success initiative in September 2017, enrollment and student success have significantly increased. In the term prior to the availability of the ALEKS assessment (17EW6) that ended August 27, 2017, Calculus 1 (MAT 225) enrollment was 87 with 69% of students achieving a "C" or higher compared to the most recent term (19EW4) that ended April 28, 2019, that had 154 students enrolled in Calculus 1 (MAT 225) with 77% achieving a "C" or higher. (Please see Example 2.)

In an effort to help reduce time to degree completion and lower the cost of enrollment, SNHU allows students to gain credit for experiences outside of the university. The Pathways to Math Success initiative expands the prior learning credit for STEM and Social Science program students through the ALEKS PPL assessment and demonstrated math knowledge. The outcome is tuition cost savings and improved success for students progressing through STEM and Social Science programs. To date, Pathways to Math Success has saved students more than \$1.8 million in course fees by granting credit for prior math experience while also providing students a math progression that scaffolds to meet their needs.

Access

Please describe how the practice has improved access to education by expanding opportunities and/or reducing barriers. 500 word limit.

Many learners, particularly adult and nontraditional students, struggle to succeed in educational structures designed for traditional student populations. SNHU recognized that enrolling all STEM students in Calculus 1 was a barrier to persistence for students who lacked exposure to math instruction that leads sequentially to Calculus or whose math skills have atrophied over time. SNHU created and built awareness for the Pathways to Success initiative to remove that barrier and improve student outcomes. By creating a clear and scaffolded math experience, SNHU sought to increase access to degree programs that require the successful completion of Calculus I.

When developing Pathways to Math Success, the STEM department collaborated with stakeholders (see list above) to re-envision math progression through STEM programs. Pathways to Success includes:

- The redevelopment of all STEM programs.
- The addition of two new required courses, Quantitative Analysis (College Algebra) and Precalculus, to provide a progression to Calculus I.
- A placement assessment, ALEKS PPL, for credit and accurate placement of students to align with prior math knowledge.
- Creation of an optional support in the student portal to prepare students for the assessment.

SNHU has expanded the initiative to a number of social science programs and to accommodate students with prior knowledge in statistics.

Tuition cost is often a barrier for returning learners. Students enrolled in STEM majors and specific social sciences majors are encouraged to take the Pathways to Math Success ALEKS PPL assessment to determine the appropriate level for their first math course. By placing students in math that aligns with their experience, SNHU aims to reduce failure rate and the need for students to repeat Calculus I, which saves students additional tuition costs. Additionally, students enrolled in an eligible program can earn as many as six credits toward their degree for successfully demonstrating knowledge required in math courses: Introduction to Statistical Analysis, Quantitative Analysis (College Algebra) and Precalculus. To date, students have saved more than \$1.8 million in tuition through the Pathways to Math Success initiative.

Faculty Satisfaction

Please describe how the practice activities has maintained a high level of faculty satisfaction. 500 word limit.

Often, when students find courses difficult or challenging, faculty can be the target of student frustration. By moving the dial on the student experience, SNHU has subsequently improved the faculty experience as well. The STEM department created the Pathways to Math Success initiative to improve student success, reduce academic barriers, and alleviate frustration. They sought to ensure that students started in a math class that was at the right level for their prior experience and could enter a prescribed pathway at the appropriate level instead of a single course option.

Since the inception of the Pathways to Math Success program, overall success in Calculus I has increased substantially by up to 21 percentage points or an average of 9.4 percentage points. This has translated to a better overall teaching experience because students are entering the course more prepared for success. To demonstrate this, student evaluations of faculty have improved from a 90% overall satisfaction rating to ratings of 95%.

By increasing student preparedness for Calculus I, educators can now spend more time teaching students Calculus rather than teaching the math skills needed for Calculus.

Student Satisfaction

Please describe how learners who are impacted by the practice express satisfaction with their learning experience. 500 word limit.

Comparison of the enrollment and success rates for Calculus 1 before and after the rollout of Pathways to Math Success (Please see Example 2) demonstrates dramatic improvements in student success in the course. Student satisfaction is evident in student evaluations of the course that have increased in positive review on average from 85 percent to 89 percent. To date, over 3,200 students have taken the ALEKS PPL assessment with more than 1,000 students earning credit for one or more math courses. Student feedback about the impact of the ALEKS PPL assessment and the assessment is positive. Below is an example of the impact on students of the Pathways to Math Success initiative.

"My name is ----- and I am from Richmond, Virginia. Math has always been my weakness. The assessment was difficult but the personalized study course has been a blast and has enabled me to take down those walls of fear of Math and I am excited to learn more. I look forward to learning together."

"Being out of school for 20 years, this was a great opportunity for me to see where I ranked in my mathematical know how. Unfortunately, some of the material was a little over my head. * This class is a great way to see where I need to start!"

"I enjoyed using ALEKS for my math course as I got to focus on what I don't know or uncertain on rather than be bored with information I have down already."

"I really liked this. It helped me understand where I was and what I needed to improve upon. I would recommend that this was offered when I had an actual math class that I was taking though."

"I wouldn't change a thing to the course. As it was Pathways to Math Success I enjoyed watching the different videos there were to offer, and then the evaluation test at the end of the course was very helpful, especially since it's been a while since I have done different types of math. I enjoyed it very much!"

(Feedback from students in the pilot MAT-010 (course) designated as a preparatory course for students taking the ALEKS PPL assessment.)

Estimated Costs

Please describe any estimated costs, including equipment needed, associated with implementing and maintaining the practice.

While SNHU did incur expenses during the initial development of the Pathways to Success initiative, the cost was relatively low compared to the more than \$1.8 million in tuition savings realized by students.

Development costs included:

- Travel expenses for assessment research;
- Assessment fees covered for students during pilot phase (over \$80,000 paid by SNHU); and • Faculty and staff costs related to course development and program redesign.