



Effective Student Support Services at Oklahoma State University to Improve Student Success in Lower-Level Mathematics Courses

This summary is part of the Charles A. Dana Center's "Notes from the Field" series, which highlights examples of innovative practices from colleges, universities, and systems.

Students who are struggling in mathematics can often find academic support in the form of one-on-one tutoring and drop-in help labs, which are commonplace at both two-year and four-year institutions. These supports provide personalized interventions and often play a key role in helping students succeed in gateway mathematics courses. Identifying effective practices in these types of student services, however, is a challenge that many institutions face. One institution sought to address this challenge, which led to a revitalized mathematics support center that not only helps students through use of data-proven practices, but also serves as a center for ongoing research to improve its student support practices.

Background

Oklahoma State University (OSU) serves nearly 21,000 undergraduate students at three campus locations.¹ The university has long been a national leader in applying data-

TAKEAWAYS

- *It is important to engage in regular, continuous evaluation of tutoring center practices and be open to new ways to support students.*
- *Ongoing training and timely preparation of the tutoring center's staff create an efficient support environment for students.*
- *Having a research-focused mathematics faculty member direct the tutoring center provides an opportunity to study student success and tutoring techniques.*



The Mathematics Learning Success Center (MLSC) at Oklahoma State University.

driven solutions to support its students in lower-level mathematics courses. That commitment achieved high visibility in 1985 when OSU opened its Mathematics Learning Resource Center (MLRC)—the first of its kind to integrate mathematics support specific to the curriculum structure. The MLRC served as a model for other universities to support their undergraduate mathematics students.

Challenges

The efforts that began in 1985 to support students in lower-level mathematics classes proved fruitful as OSU students began succeeding at modestly higher rates than their peers nationwide, but the remediation efforts did not translate to success in Calculus I, the lower-level mathematics course for STEM degrees.² The interventions that focused mainly on remediation did not seem to prepare students adequately to “do” math at the next level.

In 2010, the university tasked a committee to improve OSU’s mathematics education curriculum, placement strategies, and student support services. In its findings, the committee cited the Mathematics Learning Resource Center as providing critical support services to OSU students. However, it recommended that the center be expanded, both in size and staffing, and explore ways to help improve students’ readiness for college-level mathematics.

The university created the Success in Undergraduate Mathematics (SUMS) initiative to implement those recommendations under the guidance of Dr. William “Bus” Jaco, mathematics department head, and Dr. Chris Francisco, associate head of the department directing lower-division mathematics instruction. Dr. Jaco advocated that the center also be used as a research laboratory to study best practices in delivering student support services.

Solutions

In 2013, the MLRC was renamed the Mathematics Learning Success Center (MLSC) to emphasize its mission. The center was also relocated to enhance its visibility on campus and is currently housed in an 8,000-square-foot facility in the school's main library. The MLSC offers numerous resources to students, including more than 125 computers in an open lab, laptops available to check out, small study rooms equipped with white boards, and one-on-one support. The required check-in at the reception desk allows the center to gather information that could be shared with students' advisors as well as for evaluating the effectiveness of the center's practices.

In 2015, Dr. Melissa Mills was hired to serve as the MLSC director. With her background in mathematics education research, Mills immediately focused on developing a comprehensive tutor training program to improve student success in mathematics. Components of the training program now include giving peer tutors materials gleaned from the mathematics department (e.g., pacing guides, summaries of mathematics concepts) and providing time during bimonthly staff meetings to learn effective tutoring techniques and discuss best practices. The training also requires tutors to record select tutoring sessions and reflect on their interactions with students. These reflection activities are also a part of a research study funded by the National Science Foundation involving several collaborators at different institutions.

The MLSC's well-trained staff, enhanced services, and improved practices helped propel the center's support for undergraduate students in mathematics. The MLSC director sees how the tutor training program reaps countless benefits for both the peer tutors and their students. "Investing in the tutors is crucial [to improving student success rates in mathematics]," says Mills. Although training and evaluating the MLSC's coordinators and peer tutors require much focus and effort, they are vital to the center's success.

Results

In 2014, the MLSC recorded more than 1,600 student visits on average each week, with 23,000 student visits each academic semester. A university assessment report released that same year noted failure rates in lower-level mathematics courses "are at historic lows, and enrollment in Differential Equations is up over 60% in the past three years, indicating that students are succeeding in the calculus sequence."³ OSU's mission to offer targeted support to lower-level mathematics students is working for students pursuing all types of degrees, not just those in STEM-related fields. The center added more tutors to help students in Calculus II and III due to a surge in enrollment in those courses.

Although the center is successful and at times very busy, Mills still has continuous improvement in mind, communicating with other tutoring center directors at comparable institutions, regularly evaluating tutoring practices, and distributing surveys to every mathematics class to learn about students' use of the Mathematics Learning Success Center.

Mills is passionate about using student and peer tutor feedback to improve the MLSC's services. "The student [peer] tutors and coordinators bring all kinds of energy," she says. "They are fun, smart, creative people who have really good ideas." As an example, the peer tutors suggested extending the availability of the center's very popular exam review sessions by live streaming them on YouTube. More than 40 videos are currently archived on the MLSC's YouTube channel so students can review them at any time.⁴

Approaching her work from a research perspective, Mills notes, "No one really has data on what's happening" between the peer tutor and students. To that end, Mills secured a \$50,000 grant from the National Science Foundation to fund workshops for directors of tutoring centers to share resources and collaborate on research projects. The first workshop in May 2017 helped create a working group of researchers and practitioners at institutions across the country to investigate tutor-student interactions, evaluate tutoring centers, and design tutor

training programs. Another working group is developing a large-scale survey about different types of mathematics tutoring centers at universities across the nation. The next workshop is scheduled for May 2018.

The evolution of the MLSC's mission—from providing remediation to the more ambitious goal of creating mathematical thinkers—has increased student success rates in the lower-level courses as well as boosted the number of undergraduates choosing STEM-related fields of study. Oklahoma State University remains a leader in providing innovative mathematics support to its students, and continues its commitment to gather meaningful data about best practices and to collaborate with other institutions to keep improving student support services.

Contact Information

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Endnotes

¹ <https://irim.okstate.edu/sites/default/files/StudentProfile/2017/2017PresentStudentBody.pdf>

² <https://academicaffairs.okstate.edu/sites/default/files/advCouncil-math-finalreport.pdf>

³ https://uat.okstate.edu/sites/default/files/assessPDFs/OSRHE/2013-2014_osrhe_report.pdf

⁴ https://www.youtube.com/channel/UCVP8wZ_KK4J2fxCrFJUSjGQ

About the Dana Center

The Dana Center develops and scales math and science education innovations to support educators, administrators, and policy makers in creating seamless transitions throughout the K–16 system for all students, especially those who have historically been underserved. We focus in particular on strategies for improving student engagement, motivation, persistence, and achievement.

The Center was founded in 1991 at The University of Texas at Austin. Our staff members have expertise in leadership, literacy, research, program evaluation, mathematics and science education, policy and systemic reform, and services to high-need populations.

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