

## POLICY RESEARCH BRIEF



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ENLACE FLORIDA is a state-wide network promoting college-readiness, access, and success for underrepresented students in Florida.

### Opening the Gates to Greater College Completion Rates

As another semester of college classes begin on campuses across Florida, many of our colleges are experiencing another year of high student enrollments. At St. Petersburg College, 32,132 students walked into class on one of its 9 campuses—representing an 11.2 percent increase from the previous year.<sup>1</sup> Overall enrollment within the Florida College System (FCS) has increased nearly 24% since 2006 (Chart 1, p.6). Such a boom in student enrollment highlights the continued rise in demand for more education and greater skills. However, while more and more students are showing up to campuses throughout Florida, state investments in the FCS have continued to fall—shifting more and more of the cost burden to students and straining the system in an effort to maintain productivity and quality. Florida’s long-term economic recovery must include a commitment by state leaders to enhance higher education quality and productivity levels. During a recent speech at the University of Texas, Austin, President Obama emphasized how our future economic growth is directly tied to the education level of our workforce.<sup>2</sup> “We know that in the coming decades, a person’s success in life will depend more and more...on a higher education,” said Obama. He added, “It is a prerequisite to prosperity.” Most economists agree. In fact, a June report out of Georgetown University’s Center for Education and the Workforce stated that by 2018, 59% of all jobs in Florida will require some post-secondary training beyond high school.<sup>3</sup> That equates to 1.6 million new jobs or vacancies that call for new talent with earned college credentials. Furthermore, it is expected that a significant number of the new jobs will fall within industries related to science, technology, engineering, and math, including health care and business management. The national goal to boost education attainment rates of Americans has been widely recognized and embraced by policy makers and educational organizations around the country including Lumina Foundation for Education, the Bill & Melinda Gates Foundation, the State Higher Education Executive Officers (SHEEO), the American Council on Education, Complete College America, and the College Board.

ENLACE Florida has adopted Lumina Foundation’s BIG GOAL for Florida of increasing the percentage of Floridians age 25 to 64 with a post-secondary degree to 60% by 2025.<sup>4</sup> Today, Florida ranks 29<sup>th</sup> in the country in this measure and, as we reported earlier this year, to reach the BIG GOAL Florida will have to produce—or attract—2.3 million more working adults (aged 25 to 64) with an associate’s degree or higher by 2025. At current productivity rates, Florida will likely produce or attract only 1.9 million more by 2025, leaving the state **391,000** post-secondary degrees short of projected workforce demands.

<sup>1</sup> “St. Petersburg College sees record enrollment,” *St. Petersburg Times*, August 24, 2010, <http://www.tampabay.com/news/education/college/st-petersburg-college-sees-record-enrollment/1117005>

<sup>2</sup> Scott Bland, “Obama aims to lift college graduation rates, but his tools are few,” *The Christian Science Monitor*, August 9, 2010

<sup>3</sup> Georgetown University Center for Education and the Workforce, “Help Wanted: Projections of Jobs and Education Requirements Through 2018”, 2010 <http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/State-LevelAnalysis-web.pdf>

The threat of such a shortfall coupled with the continuous growth in workforce requirements should compel our institutions of higher education to double the efforts to seek out ways to increase productivity and improve the success rates of our students. Part of this generally means that our students should also intensify *their* efforts to prepare for and commit to do everything possible to succeed in college-level courses. In addition, such statistics should push state leaders to make “improving college completion rates” an economic development priority. Finally, such alarming economic outlooks should provoke universities, colleges, departments, and professors to do everything they can at the local level to facilitate the success of students who enroll in their classes, particularly those introductory courses that **must be passed** in order for students to enroll in higher level courses.

For this report we focus on the success rates of students taking introductory math courses within the Florida College System (FCS). These courses, commonly referred to as “Gatekeepers,” typically constitute a significant barrier to college completion for many students. During the first year of college, while adjusting to the college experience and the more rigorous academic demands of higher education, students are likely to enroll in courses like College Algebra (MAC 1105), Math for Liberal Arts I (MGF 1106), Math for Liberal Arts II (MGF 1107), and Elementary Statistics (STA 2023). As part of the larger effort to improve college graduation and retention rates in our state, student performance in these gatekeeper courses constitute an important measure toward that end. Fortunately, for many FCS institutions, student success rates in key math courses have improved since 2008.

## GRADUATION RATES IN THE FLORIDA COLLEGE SYSTEM

The Florida College System (FCS) has traditionally received high marks on its overall graduation rate and in fact, leads our nation. The SREB reported that the U.S. average 3-year graduation rate for students who entered a community college in 2004 was 20%. However, Florida exceeded the national average that year by 10 points, and led all southern states with a graduation rate of 30%. ENLACE Florida applauded the great work of the FCS in a previous policy brief, but as we have emphasized before, this is no time for our state to rest on its laurels. As the demand for a higher education continues to climb, and as Florida’s colleges enroll more limited-income, first generation students, all of our FCS institutions will have to work harder to keep graduation rates at current levels including maintaining the focus on student performance in math gatekeeper courses. We should continue asking key questions on how we can improve student success and outcomes while not closing the doors to college or lowering standards. We should also be cautious and not allow the pressure to raise graduation rates threaten Florida’s commitment to open access and a high-quality higher education system.

## FCS STUDENT PERFORMANCE IN MATH GATEKEEPER COURSES

Out of all college-level math gatekeeper courses, College Algebra is by far the course registering the highest enrollment figures. In 2009, over 91,000 FCS students took the course. To put this high number in perspective, this is nearly four times the annual enrollment of the College Algebra course at our eleven State University System (SUS) institutions that on average enroll a total of 25,000 students annually in the course. The popularity of College Algebra can be explained simply by its “gatekeeper” status to other required math courses for most academic majors. “Many students take College Algebra to simply keep their options open.” said Jimmy Chang, Program Chair of the Math Department at St. Petersburg College. “Maybe they haven’t decided on a major, College Algebra fulfills the general education requirement and is therefore often considered a safe choice.”

Safe choice indeed. College Algebra is the key prerequisite to gain access to other math courses such as Calculus and Trigonometry—necessary classes for a student looking to earn a bachelors degree in a science, technology, engineering, or math-related field. We first identified five mathematics courses that function as gatekeepers. Then, we asked for the **non-passing** rate for students in each one of these courses at the 28 FCS institutions. A grade of D, F, or W

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<sup>4</sup> Lumina Foundation’s Strategic Plan, GOAL 2025, p.1; [http://www.luminafoundation.org/goal\\_2025/Lumina\\_Strategic\\_Plan.pdf](http://www.luminafoundation.org/goal_2025/Lumina_Strategic_Plan.pdf)

was considered “non-passing” (DFW rate) in a college-level mathematics course.

As shown in Table 1, College Algebra had the highest enrollment of any mathematics gatekeeper course, and 37.4% of the 91,459 students who enrolled in that course earned a non-passing grade of D, F, or W—an improvement from 2008 when 38.5% of the 84,655 students who enrolled earned a non-passing grade. As highlighted in Table 1, non-passing rates in key math gatekeeper courses have fallen slightly system-wide from 2008 to 2009—an improvement during a period when overall enrollment increased.

**Table 1**  
**Enrollment and Non-Passing (DFW) Rates in Florida College System**  
**Mathematics Gatekeeper Courses, 2008-2009**

Course Number	Course Name	2008 Annual Enrollment	2008 Non-Pass (DFW) Rate	2009 Annual Enrollment	2009 Non-Pass (DFW) Rate
MAC 1105	College Algebra	84,655	38.50%	91,459	37.40%
STA 2023	Elementary Statistics	43,302	28.80%	47,170	27.30%
MGF 1106	Mathematics for Liberal Arts I	21,312	26.40%	19,420	25.80%
MAC 2233	Calculus for Business & Social Sciences	15,039	35.80%	15,925	35.70%
MAC 1114	Trigonometry	12,939	37.00%	14,265	36.20%

Source: Division of Florida Colleges, Florida Department of Education

Of these gatekeeper courses, one (Mathematics for Liberal Arts Majors) is designed for Students in a Liberal Arts track. The other four courses are designed for students in a Traditional Track for Mathematics, Science, Engineering, and Business Majors. The two most popular Traditional Track courses based on enrollment are College Algebra and Elementary Statistics. A closer look at student performance rates in our most popular courses, as presented in Table 2, reveals significant reductions in math non-passing rates in College Algebra and Elementary Statistics at a few of our institutions from 2008 to 2009 as highlighted in green. At Florida Gateway College in Lake City, only 15.4% of students enrolled in Elementary Statistics in 2009 earned a “D”, “F”, or “W” compared to 40.6% the previous year. Pasco-Hernando Community College experienced similar improvements in student performance in the same course with non-passing rates dropping from 33% in 2008 to 22.2% in 2009. Tallahassee Community College also showed significant improvement. At some of our larger institutions such as Broward College, Florida State College at Jacksonville, Miami-Dade College, St. Petersburg College, and Valencia Community College, improvements in student performance in College Algebra were positive. Most notably, St. Petersburg College which saw a 7.4% improvement in its College Algebra non-pass rate between 2008-2009.

### **BEST PRACTICES ON IMPROVING STUDENT SUCCESS IN MATH GATEKEEPER COURSES**

At Florida Gateway College (FGC), Paula Cifuenties, Professor and Faculty Coordinator for the Math Department, attributes her institutions’ improvement in pass rates with the development of the Quality Enhancement Program (QEP). The QEP is a 5-year plan to improve student success substantially within a select sequence of mathematics courses ranging from Arithmetic to College Algebra. “The program began when we looked at the entire college atmosphere and noticed that many students entering these classes (MAC 1033, MAC 1105) would struggle,

give-up and eventually dropout,” said Cifuenties. “We wanted to make sure we were providing our students with the best experience possible and so we decided to focus heavily on these math courses. We truly believed that if we could get students engaged, withdrawal rates would be lowered.”

One technique employed by FGC to promote student engagement in the classroom was the adoption of the Navigator System designed by Texas Instruments. Implemented in 2009, the Navigator allows instructors and students to communicate instantly via calculators. This handy pocket gadget has become a powerful classroom communication tool at FGC. Wirelessly networking students’ individual calculators to the instructor’s computer, the entire class can easily and quickly relay answers, submit quizzes and tests, and receive immediate feedback regarding specific concepts. The technology enabled instructors in 2009 to maximize classroom learning time while empowering students with communication and critical thinking skills. “We encouraged students to justify and defend their answers while exploring the thought process,” said Cifuenties. “These (critical thinking) skills, we believe, will inevitably bleed over into other courses.”

At St. Petersburg College, students can ask for assistance at one of three Learning Support Commons on its campuses. The commons are equipped with computer work stations and staffed by student tutors. The Commons reinforces learning in the key areas of math, reading and writing. Such accommodations have been successful in supporting student efforts to remain engaged with their course work while also helping students explore their personal learning style. Santa Fe College’s Math Studio is currently redesigning the classroom experience by phasing-in required computer lab time with traditional lectures. SFC students in Intermediate Algebra, the school’s chief gatekeeper course, deliver homework and quizzes directly through the software programs while also receiving one-on-one tutoring from former students and even instructors themselves. Such accommodations support student efforts to remain engaged with their course work while also helping students explore their personal learning style.

In addition to tutor-stocked computer labs, such institutions as Hillsborough Community College are providing students with online programs and forums which can be accessed remotely. MathXL, a program linked with Pearson textbooks and utilized by the majority of instructors in the gatekeeper courses, offers both students and educators additional support at their convenience. SmarThinking, a 24/7 online tutoring forum, permits students to network to math experts on a wide range of topics, free of charge.

FCS Institution	College Algebra (MAC1105) %Non-Pass		Elem. Statistics (STA2023) %Non-Pass	
	2008	2009	2008	2009
Brevard C.C.	35.7%	34.9%	25.2%	25.7%
Broward College	44.6%	43.6%	37.9%	34.7%
Central Florida	29.4%	30.9%	18%	13.8%
Chipola College	29.4%	32.8%	21.7%	23.2%
Daytona State	38.4%	33.8%	23.3%	25.5%
Edison State	31.7%	29.9%	23.6%	23.4%
Fl State C./JAX	35.5%	34.9%	23.4%	28.5%
Florida Keys	11.1%	16.6%	22%	18.9%
Gulf Coast	33.4%	34%	28.3%	35.7%
Hillsborough	45.4%	45.4%	33.7%	33.4%
Indian River	38.1%	37.2%	32.4%	26.5%
Florida Gateway	44.7%	38.3%	<b>40.6%</b>	<b>15.4%</b>
Lake-Sumter	39.1%	42%	12.9%	24.9%
State College/FL	41.6%	39.7%	26.5%	24.5%
Miami Dade	43.1%	41.3%	25.7%	27.6%
North Florida	17.6%	35.6%	23.4%	37.2%
NW Florida	34.7%	33%	27.3%	32.9%
Palm Beach	40.2%	37.4%	37.6%	31.1%
Pasco-Hernando	32.2%	31.8%	<b>33%</b>	<b>22.2%</b>
Pensacola State	29.9%	29.2%	26.2%	24.7%
Polk State	39.8%	47.4%	26.1%	20.7%
St. Johns River	29.6%	32.3%	21.1%	33.7%
St. Petersburg	<b>45.2%</b>	<b>37.8%</b>	<b>35.9%</b>	<b>30.7%</b>
Santa Fe College	34.8%	35.7%	29%	22%
Seminole State	39.9%	42.8%	24.9%	15.6%
South Florida	17.4%	23.9%	21.9%	36.2%
Tallahassee C.C.	45.9%	43.2%	<b>32.4%</b>	<b>20.6%</b>
Valencia C.C.	31.4%	30.6%	25.2%	24.1%

Source: Division of Florida Colleges, Florida Department of Education

With all of these innovations popping up around campuses, the responsibility to succeed ultimately falls on the student. And yet there is still room for school leaders to step in and guide students in successful decision making. “There are a number of factors that contribute to low pass rates for students.” suggests Chang.

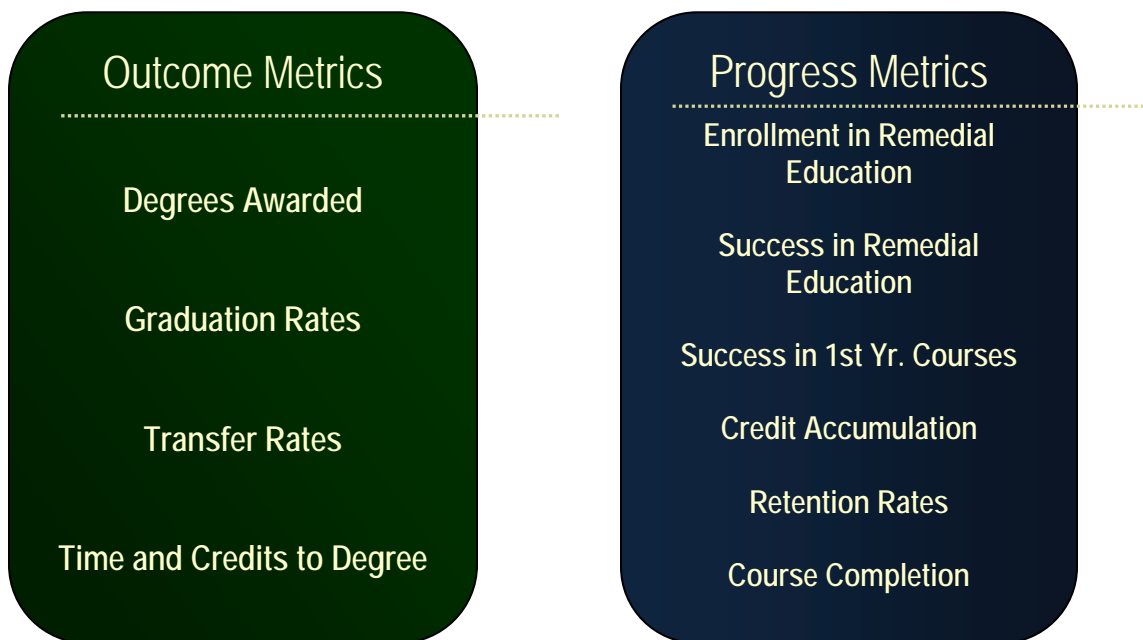
“Work and family life, class structure and environment, and switching between majors all contribute. Some students take a prerequisite class then wait too long for the follow-up course. With math, it can be use it or lose it. Our institution looks to step in and help students build a plan to succeed.”

Seminole State College of Florida agrees in highlighting student engagement for improving completion rates. Delivered through the school’s Faculty Institute, instructors receive professional development training in workshops centered on the topic of student engagement. With enrollment numbers increasing, the student/instructor relationship can be strained. Additional trainings, along with continued support may better prepare educators to prepare for this strain. Collaboration between actively engaged educators, students, and policy makers will be the driving force in seeing completion rates soar in Florida.

## POLICY IMPLICATIONS

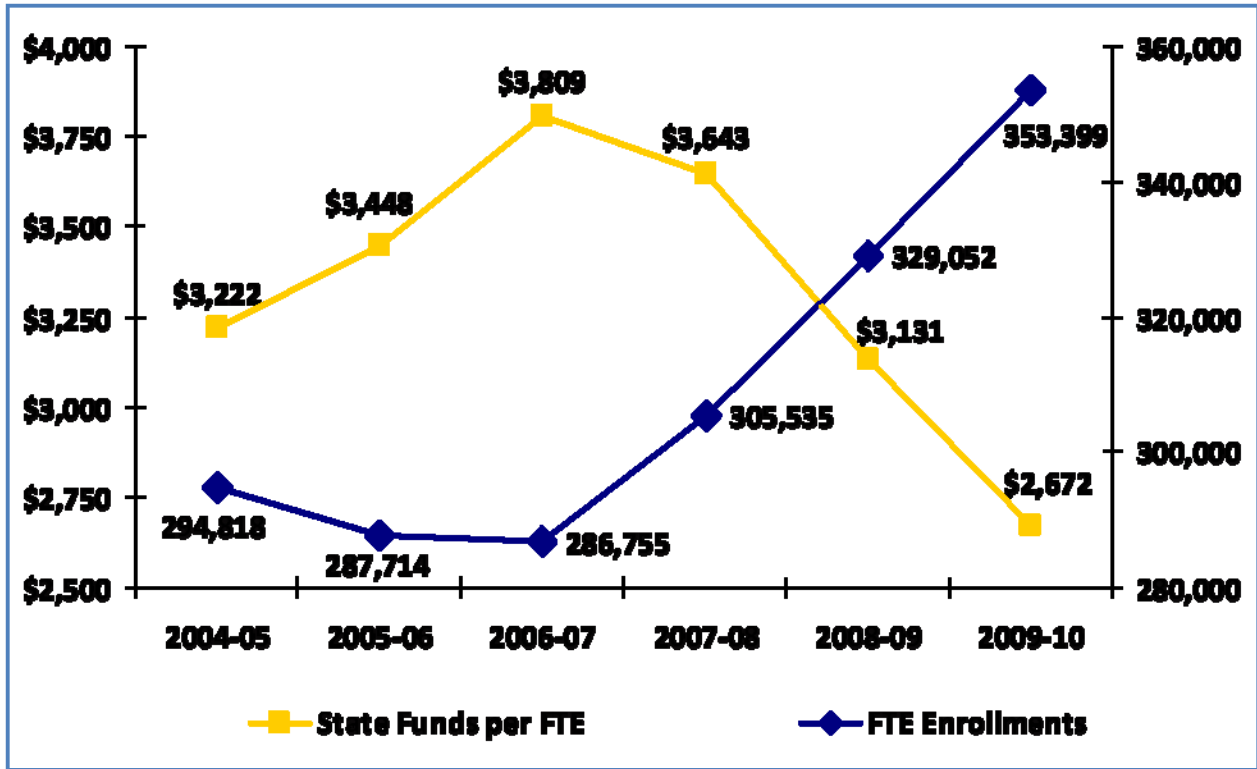
- State leaders and FCS institutions should continue to work closely with national partners like the Southern Regional Education Board (SREB) and National Governors Association (NGA) to not only agree on metrics that help measure *outcomes*, but to incorporate metrics that measure *progress* into state accountability laws. According to a recent NGA report *Complete To Compete*, “breaking the data into two categories enables policy-makers and the public to track how well the state and its public institutions are currently performing against the completion goal, as well as whether they are on track to meet the goal in the future (See Chart 1).” ENLACE Florida endorses the NGA College Completion Metrics and encourages state and FCS institutions to collect, disaggregate, and publicly report on each outcome and progress metric. ENLACE Florida strongly believes that when the general public is informed on the progress we are making as educators, the public in turn is more likely to provide policy makers with the public will and support they need to act in the best interest of our students and the economic needs of Florida.

**Chart 1: NGA College Completion Metrics**



- Since 2006, enrollments in the FCS have continued to climb while state funds per FTE have fallen significantly (See Chart 2). In 2006-07, total enrollment in the FCS was at 286,755 with state FTE funding at \$3,809; however, in just three years enrollment has jumped to 353,399 in 2009-10 while state FTE plummeted to \$2,672. Such reductions in state funding can be explained by the Great Recession and its impact on the state budget. But with student enrollments expected to continue its climb, state policy makers cannot realistically expect to see improvements or to be able to maintain success rates in key courses like College Algebra if state investments in the FCS continue to fall. The Florida Legislature should make a commitment to increase per FTE funding to 2007 levels within the next two years and commit to do everything possible to reverse the “total cost” burden shift to our students, particularly our limited-income students.

**Chart 2: State FTE Funding, 2004-05 to 2009-10**



Source: Division of Florida Colleges, Florida Department of Education

- Lastly, we encourage FCS Presidents, Academic Affairs officers, faculty, and staff to take note of the select best practices highlighted in this brief and to connect with their fellow FCS institutions to learn more about their challenges and successes with adopting and implementing such approaches. Given that a number of variables contribute to success rates in these particular courses, we hesitate to draw any definitive conclusions about the passing rates in mathematics gatekeeper courses. Our data would not (and was not designed to) substantiate any claim that any particular institution, department, or professor is at fault for high rates of failure in their math gatekeeper courses. We can only express our concern and recommend that math departments, instructors, and support personnel take a closer look at their own experiences very carefully.

- To encourage and facilitate independent analysis, we will happily make our database available to any institution. We stand ready to assist any institution with research and analysis on this topic. A comprehensive analysis of a particular course or professor would include a careful review of student preparation, test scores, class size and structure, teaching methods, and curriculum by course and professor. As ENLACE Florida transitions to become the Florida College Access Network, we stand ready to facilitate and support any community or institutional effort to improve student success rates in key math courses and efforts to improve college completion rates in general.

Any strategic campaign to improve student success rates in higher education should include a careful review of all policies and programs affecting student performance in gatekeeper courses, including financial aid. As we have stressed before, colleges do not have to wait for a change in state policy to enhance student success at their institutions. To reach the “Big Goal” of increasing the percentage of Americans with a higher education degree to 60%, students, families, professors, administrators, and support staff will *all* have to do their part. Improving student performance in gatekeeper courses is but one small component of a complex problem that will require coordinated efforts in a number of related fields. In some particular cases, gatekeeper courses may constitute an unfair barrier to student success in higher education. Colleges can improve student performance by taking a number of steps, including:

- Conducting an in-depth examination of student performance in traditional gatekeeper courses, combining student grades with other factors, such as student evaluations of the course and instructor;
- Initiating course redesign in gatekeeper courses that have high DFW rates, recognizing that some colleges have initiated such redesigns when DFW rates were above 35%;
- Providing professional development support for faculty as part of the redesign effort, with a particular emphasis on the means by which these traditionally passive-learning gatekeeper courses can incorporate more active learning design elements;
- Providing more staff and budgetary support for student support services that include supplemental instruction as part of a larger student success strategy;
- Collaborate with and support efforts to define college readiness standards and align the high school curriculum with course expectations at colleges and universities.



**ENLACE FLORIDA** is a statewide network promoting college readiness, access, and success for Latinos, African-Americans, and other underrepresented students in Florida through non-partisan research, communication, advocacy, and support. The views expressed in this Policy Brief were developed independently and do not reflect the opinions of the universities with which the Leadership Team and staff are affiliated.