

**ACCESS ALGEBRA:  
MEETING THE NEEDS OF UNDER-PREPARED COLLEGE ALGEBRA  
STUDENTS JUST-IN-TIME**

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### **Introduction**

Complete College America (CCA) is a nonprofit organization with the mission of increasing retention and graduation rates. Guiding strategies for CCA in 2011 included technology-based diagnostic assessments and modularized content remediation coursework. Students who fell below the cut scores would be concurrently enrolled in a college-level course and a diagnostic-based learning support course. These students would work at an accelerated rate using a learning mastery approach which was supplemented by a student success skills component. In Fall 2011, CCA awarded a grant to the state of Georgia to produce a model to fast-track learning support students through developmental courses and college algebra in a single semester. At Georgia Gwinnett College, a co-requisite model was developed and redesigned to create Access Algebra.

### **Who is Georgia Gwinnett College?**

Georgia Gwinnett College (GGC) is a four-year public college that is a member institution of the University System of Georgia. The college is located in Lawrenceville, Georgia, which is approximately 30 miles northeast of downtown Atlanta. GGC has an open access mission, which, according to the National Center for Public Policy and Higher Education, is defined as a public four-year college or university that admits at least 80% of its applicants. The college is committed to continuous review and change through assessment, the holistic development of students, and the innovative integration of technology into educational experiences. The college provides access to targeted baccalaureate and associate level degrees that meet the economic development needs of the diverse population of Gwinnett County. The mission statement of the college includes a commitment to producing contributing citizens and future leaders for Georgia, the nation and the world. GGC graduates are inspired to contribute to the local, state, national, and international communities and are prepared to anticipate and respond effectively to an uncertain and changing world.

The college opened its doors to 118 juniors and seniors on August 18, 2006 and currently enrolls more than 10,000 students, where a majority of its students are traditional (83.9%, fall 2014). GGC has a diverse population of students with 39% white, 31% black (non-Hispanic), 16% Hispanic/Latino, 9% Asian, 4% multiracial, 1% race unknown and a small population of Hawaiian/Pacific Islanders. The ratio of male to female students is about 50/50 with slightly more female students (55%) being enrolled in the fall of 2014.

### **Developmental Math at Georgia Gwinnett College**

In order to support the goals and initiatives of the college, the School of Transitional Studies (STS) at GGC directly addresses the needs of students who may require foundational academic skills or assistance with college-level work in order to be successful. The goals of the STS focus on keeping students on track to graduate regardless of their academic major. The STS provides a wide variety of student-centered assistance, including academic advisement, and placement testing. The STS also coordinates an Academic Enhancement Center that provides tutoring in a wide variety of academic subjects and as well as diverse workshops focusing on empowering students for success.

The objectives of the STS are primarily focused on student success programs and student support initiatives. Student Success Programs are in place at GGC in order to ensure that all GGC students, regardless of their academic preparation, have a comprehensive student support program that allows them to develop the skills needed to succeed in college. The STS also sponsors courses in English, reading and math for high school graduates whose placement test scores place them below college level courses in these areas. These learning support courses help students to build a strong foundation for college level courses. It is within this context and to serve the student success goals of the STS that the foundational level mathematics courses have been developed. Access Math is one of the Student Success mathematics courses designed specifically to allow students to advance quickly toward college level work.

## The Co-requisite Model

In the Spring 2012 semester, Accelerating College Completion by Enhancing Student Success (Access) Math was a new course being offered at GGC that combined both pre-college algebra and college algebra into a single one-semester course. The Access Math course was not self-paced, as our stand alone developmental math class was, and students were expected to finish both courses in a single semester. Therefore, the design took the form of a 3 credit hour course (College Algebra) plus a 4 credit hour course (Pre-College Algebra) for a total of 7 credit hours. Only students who had taken pre-college algebra in a previous semester and had completed 70% of the course were invited to enroll. The Access Math course utilized ALEKS, a web-based, adaptive learning system. Students were given an initial assessment in ALEKS in order to determine what knowledge had been acquired prior to instruction and then topics were delivered in modules using ALEKS. Each module had specific start and end dates and students were expected to progress according to a specified schedule. The developmental math concepts were presented sequentially during the first four weeks of the course. Classroom instruction supplemented the online textbook, video presentations, and explanation help resources within ALEKS. If a student completed the module before the end date, then they were given an assessment over the module and allowed to move to the next module. A paper-and-pencil test was given over the module per the instructor's schedule around the end date of the module. This was to ensure that students had mastered the same material as the students enrolled in the regular College Algebra course.

ALEKS operated much like homework in a regular math course. Approximately one-third of a student's course grade came from successful completion of the topics in ALEKS. About half of a student's course grade came from the in-class paper and pencil tests. The number of such tests did vary from one instructor to another. Ten percent of a student's course grade came from attending class. A final exam was given at the end of the course for the College Algebra portion. Students took the Compass test at the end of the semester over the Pre-College Algebra portion. In order to successfully complete the course, students were required to be successful in both the Pre-College Algebra and the College Algebra portions.

The first module, Chapter P, was pre-college algebra material. Completing that module and test with a grade of C or better qualified the student to take the Compass at the end of the semester. Scoring 37 or better on the Compass allowed the student to exit Pre-College Algebra with whatever grade had been earned on the module. The rest of the pie was College Algebra material. The grade for College Algebra came from the completion of the rest of the pie and the student's performance on tests and the final exams. If the student passed the Compass exam and passed College Algebra, then they received the appropriate passing grades for each course. If the student passed the Compass exam and did not pass College Algebra, then they received the appropriate grades for each course. On the other hand, if the student did not pass the Compass exam, then they received an incomplete grade for both the Pre-Algebra course and the College Algebra course.

Figure 1 below shows a comparison of the success rates for the Pre-College Algebra portion of the course and the Pre-College Algebra (stand-alone) course. A total of 122 students were enrolled in Access Math, and 910 students were enrolled in the stand-alone Pre-College Algebra course. A total of 70.5% of the students exited learning support through the Access Math model. The chart below shows that a greater proportion of students enrolled in Access Math earned passing grades (A %, B%, C%) in Pre-College Algebra content than students enrolled in regular courses. However, when the success rates were measured in the College Algebra portion of the course, the results were less than anticipated. A greater proportion of students earned passing grades in the regular sections of College Algebra than Access Math.

**Spring 2012 Grades in Pre-College Algebra**

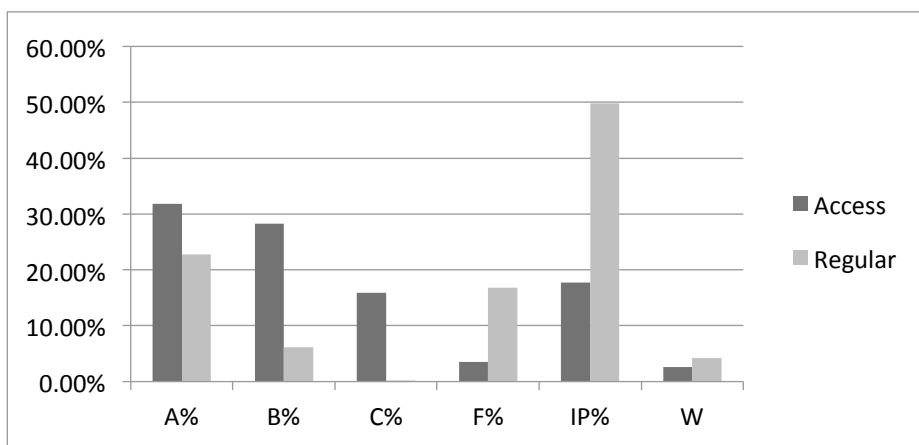


Figure 1: Comparison of Pre-College Algebra course in both models

**Spring 2012 Grades in College Algebra**

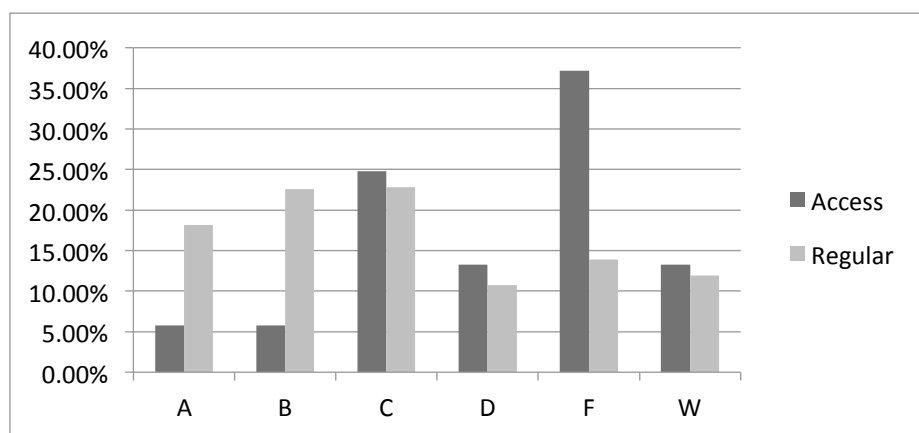


Figure 2: Comparison of College Algebra course in both models

The results were mixed, but they were also encouraging. The higher success rates in Pre-College Algebra for Access may have been due to students having had to continuously apply their pre-college algebra skills and concepts in the college algebra portion, leading to better retention which helped students pass the Compass. However, since the focus of the Access course was not placed on college algebra, their college algebra skills remained weak. The Access faculty met on a weekly basis to reflect and improve on the Spring 2012 Access Math Model, and in concert with the dean, prepared new methodologies for Fall 2012.

In the Fall 2012 semester, the focus of Access shifted from Pre-College Algebra to College Algebra. The entry requirements were altered to allow new admits to the college who had a Compass exam score of 30 – 36 to take Access Math voluntarily. The course utilized MyMathLab (MML) instead of ALEKS, which was the same web-based tool used in the existing College Algebra courses. The emphasis was still learning math by doing math, but MML also had many useful features such as “Help Me Solve This”, “View an Example”, “Ask my Instructor”, lecture videos, animations, PowerPoints, and tutoring to assist students in their learning. The developmental math concepts were presented in one of two ways, either just-in-time as dictated by student need or sequentially during a planned portion of the course schedule. The results from the Fall 2012 implementation of the Access Math model are shown in Figure 3.

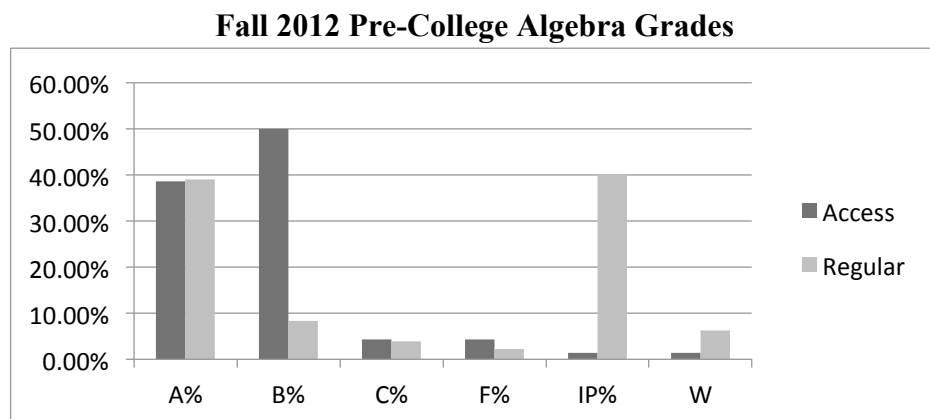


Figure 3: Comparison of Pre-College Algebra course in both models

### Fall 2012 College Algebra Grades

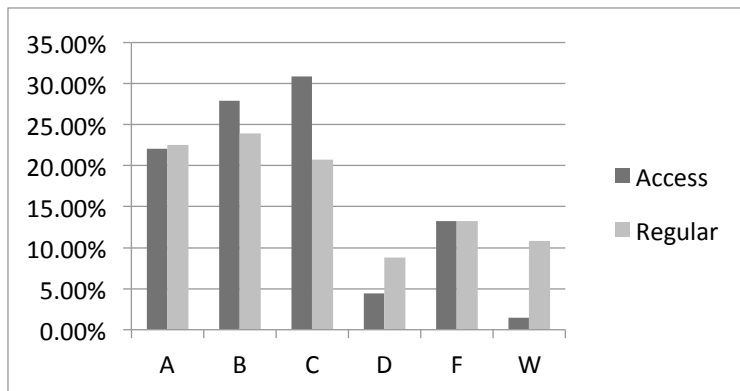


Figure 4: Comparison of College Algebra course in both models.

A total of 72 students were enrolled in the Access model, and 902 students were enrolled in the stand-alone Pre-College Algebra course. A total of 90.3% of the students exited learning support through the Access model. Compared to Spring 2012, Fall 2012 Access results in College Algebra were very promising; a higher proportion of students earned A's, B's, and C's in Access than in regular College Algebra sections. Due to the success of this version of the model, it was continued through the Spring 2014 semester.

During the Spring 2014 semester, the University System of Georgia (USG) made recommendations to all of its schools regarding developmental education. Their recommendations included a call to focus on college level math as opposed to developmental education, to develop STEM and non-STEM paths for co-requisite education based on a student's choice of major, to implement a co-requisite approach within the development of a yearlong path, and to use multiple measures for placement. Other recommendations involved requiring the colleges to terminate use of the Compass exam for exit and to align course outcomes with the Common Core.

As result of these recommendations, GGC made some modifications to the Access Math model. For Fall 2014, College Algebra remained as the focus of the Access Math course and the developmental math concepts were presented in a format that offered just-in-time support. Access Math consisted of a section of Access Algebra for two credit hours and a section of College Algebra for three credit hours for a total of five credits. Homework was assigned and graded and tests and quizzes were given (in-class and online) over the chapters covered. This was done to ensure that the students mastered the same material as regular College Algebra students. Study skills were also covered in this class and counted for 10% of the course grade of Access Algebra. Although much of the work done in class was online, attendance was a requirement and counted for 5% of the course grade in College Algebra.

A final exam was given at the end of the course for the College Algebra portion. All students who had an average of 80% or higher in College Algebra on the last day of class were exempt from the Access Algebra final exam (the Compass exit test). This policy motivated students to work hard in order to earn and keep an average grade of 80% or

higher throughout the semester. Students who had an average of less than 80% in College Algebra on the last day of class were required to take the Access Algebra final exam (the Compass exit test). A grade C or better at the end of the course gave the student credit for both Access Algebra and College Algebra. If a student received a grade D or F in College Algebra and passed the Compass Exit exam, then the student received credit for Access Algebra only and was eligible to take either the non-STEM gateway mathematics course or STEM gateway mathematics course. Nevertheless, if a student received a grade of D or F in College Algebra and did not pass the Compass Exit Exam, then he did not receive credit for either course.

Figure 5 shows that this model of co-requisite course delivery has proven to be quite successful. A total of 190 students enrolled in Access in the Fall 2014 semester. The students exited learning support at a rate of 77%. Although the exit rates of Fall 2014 Access model is lower than then Fall 2012 model, the student success rates still remain high even after the credit hours were reduced from four credits to two credits.

**Fall 2014 Access Algebra Grades**

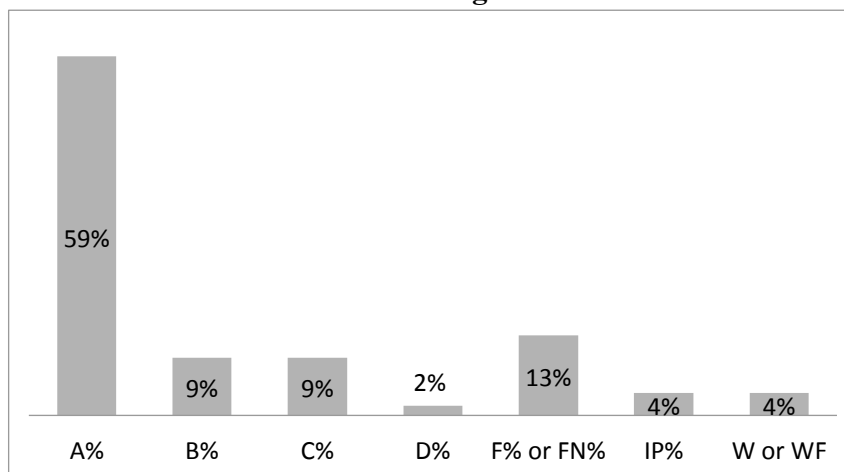


Figure 5: Grades in the new 2-hour Access Algebra course

**Fall 2014 College Algebra Grades**

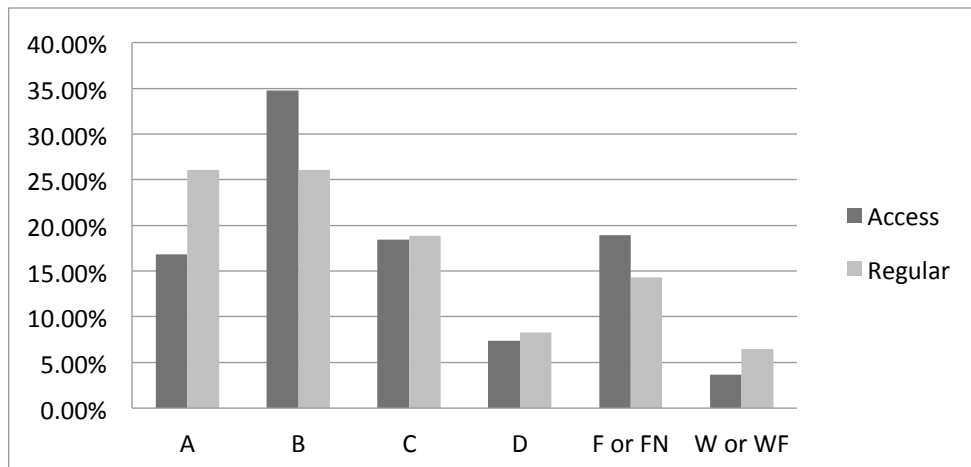


Figure 6: Comparison of College Algebra course in both models

We had a total of 917 students enrolled in the regular College Algebra sections and 190 students enrolled in the Access model. The success rate of the students earning A, B, or C in the regular college algebra sections was 70.99%. The success rate of the students earning A, B, or C in the college algebra sections paired with Access Algebra was 70.00%. Although the success rate of Access Algebra did not exceed the rates of regular College Algebra, the results are astounding when one considers that these students were underprepared for regular College Algebra for the Fall 2014 semester, but 70% of them were still able to complete college algebra content in a single semester. This model continued to be a huge success for GGC students.

### Moving Forward

GGC will continue its plans in the implementation of the USG recommendations. A higher proportion of underprepared students will be directed into college-level gateway courses with mandatory, just-in-time instructional support. Research has shown that many more students can succeed in college-level gateway courses with additional support than are currently being placed into them. Therefore, the college is intentionally making these courses the initial math placement for more students. The plans for the Fall 2015 semester include establishing a lower entry requirement for Access Math which will be offered in separate STEM and non-STEM Access Math models based on the student's chosen major of study. The minimum Compass score needed for placement into these courses will be reduced from 30 to 28 which allows more students to be eligible for Access Math. For the time being, students will be automatically placed into a Foundations (pre-college) course or a co-requisite course based on their Compass scores. However, high-stakes placement exams like the Compass exam have been shown to be poor predictors of college readiness and this phenomena unnecessarily sends many students into remediation each year. Therefore, at GGC, a plan is forthcoming that will use a placement model that includes multiple measures in order to place most



underprepared students in college-level courses with co-requisite academic support within which many more of those students are predicted to succeed. Traditionally, first year college math courses are perceived as a barrier for student success. However, the Access Math model has served as a spring board for students so that GGC can realize its mission of producing contributing citizens and leaders who will serve the local, state, national and international communities.

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