Improving mathematics success rates through proactive faculty engagement.

**Title**: Improving mathematics success rates through proactive faculty engagement.

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1: **Project Goal**

A: To increase successful completion rates in developmental mathematics courses through two module-based course delivery systems: Fast Track (8-week) and Extended Track (Daily) Learning.

2: **Reasons For Project**

A: Full-time developmental and transfer-level mathematics faculty have examined pertinent entry and completion rate data in all levels of developmental mathematics and in College Algebra. On average, over 80 percent of students enrolling at the college need at least one developmental mathematics course. Students must complete as many as four levels of appropriate developmental mathematics courses, yet many do not make it through the developmental education sequence. Non-successful grades of no-credit and withdrawal rates in developmental mathematics represent over 50 percent of all grades. Failure to complete the developmental mathematics sequence prevents students from enrolling in College Algebra, which is a requirement for an Associate of Arts or Associate of Science degree.

3: **Organizational Areas Affected**

A: The instructional divisions affected directly by this action project are Academic Success, which houses developmental mathematics, and Mathematics, Natural and Social Sciences, which houses college-level mathematics courses. In addition, these divisions must work closely with the division of Student Services in order to ensure appropriate placement of students and scheduling of classes.

4: **Key Organizational Process(es)**

A: The organizational processes that should improve by this action project are increased communication and collaboration between developmental and transfer-level mathematics departments. Specifically, both departments will work together to develop curriculum, align courses, and implement and assess course delivery.

5: **Project Time Frame Rationale**

A: The developmental mathematics is in the process of streamlining its course offerings from four levels to three levels and creating a module-based curriculum. In spring 2010, both mathematics departments will work together to develop policy and create a proposal to submit to the appropriate college committees for approval of the new delivery systems. Both departments will work closely with the division of Student Services to explore student placement and class scheduling options. A pilot of the Fast-Track course will take place in fall 2011, and an Extended Learning courses pilot will take place in spring 2012.

6: **Project Success Monitoring**

A: At the end of the pilot programs, data from the pilot sections will be compared to sections of the traditional delivery method courses. In both pilot sections, there will be at least a modest increase (between 5-10%) in successful grades (A, B, and C) compared to traditional sections. Analysis of completion data will take place at the end of each semester.
### Project Outcome Measures

A: Initial success will consist of successful cooperative efforts between both math departments and gaining approval to offer the alternative methods of course delivery. Indicators of success will be lower rates of D, F, W, and I in both the Fast-Track and Extended Learning courses compared to traditional delivery systems.

### Project Update

#### 1: Project Accomplishments and Status

A: Based on the feedback from the last annual report the Math departments began planning regular meetings during the Spring 2011 semester to generate new ideas for the AQIP project. The first of those meetings included the Developmental Mathematics department chair and a College Algebra faculty member. During this meeting, time was spent on reorganizing and developing a timeline of tasks to be accomplished in order to have a smooth transition in developing and implementing Extended and Fast Math courses. Many other meetings took place over the semester that included various departments involved in the registration, advising, and financial aid processes in order to discuss the logistics and devise a plan for offering 8-week courses. The Developmental Mathematics and Mathematics departments also met to discuss the design and admission requirements for the Fall 2011 pilot. The Mathematics departments recommended offering one eight-week Intermediate Algebra course followed by College Algebra in the second eight weeks as a pilot. The first pilot will be offered Fall 2011.

#### 2: Institution Involvement

A: All areas affected by the implementation of 8-week courses were involved in the planning process including administration and faculty members: Vice President for Instruction, Vice President for Student Services, Vice President for College Advancement, Deans of Academic Success and Mathematical Sciences, Chair of Developmental Mathematics, Chair of Mathematics, faculty members for the Developmental Mathematics and Mathematics departments.

#### 3: Next Steps

A: The 8-week courses will be piloted in Fall 2011. The student must enroll in both Intermediate Algebra and College Algebra at the beginning of the semester. The Intermediate Algebra class will meet during the first 8 weeks and College Algebra will meet the second 8 weeks on Tuesdays and Thursdays from 8:00 am – 10:40. In the event a student is unsuccessful in the Intermediate Algebra course during the first 8 weeks the student will have the opportunity to re-enroll for the course during the second 8 weeks. The Developmental Mathematics department did not want to restrict the selection of students for the pilot by focusing on the students with high COMPASS or ACT scores, but want to maintain a true pilot by offering the opportunity to all students. Focusing on students who have greater chances of being successful would skew the data during the assessment phase of the project and would not depict a true representation of the success of our student population. Therefore, the 8-week course is open to anyone that meets the requirements for enrolling into Intermediate Algebra (ACT 18-20 and COMPASS 33-49). Once the pilot is completed the data will be analyzed to determine the overall success. Both departments will meet in Fall 2011 to discuss the offerings of extended courses to students that need more contact time in class.

#### 4: Resulting Effective Practices

A: Communications and collaboration between Academic Divisions, Departments and Student Services Divisions have improved tremendously. Previously some areas had been operating in “silos”. This project has helped bridge the gap in communication. This project has encouraged similar approaches in other areas and departments.

- College Algebra will be offering an additional 8-week course outside of the action project. It will be offered the first 8 weeks of the semester.
- Currently, the Developmental Mathematics department offers three levels of developmental mathematics. Plans will be made to expand fast track opportunities to the lower levels of developmental math and offer additional sections in the evenings and Saturday. By expanding these opportunities students will have the ability to complete all mathematics courses within a year.
- The Developmental Writing and English faculty have partnered to allow students to enroll in English Composition Fundamentals.
and English Comp I as a Learning Community. Both Reading and Developmental Writing Departments will also offer 8-week courses.

### Project Challenges

#### Financial aid challenge:
Financial aid is based on the 11th day of classes. Students will not receive their proper aid if they are not registered for all of their courses by the 11th day of class. Therefore, allowing students to register for the first course at the beginning of the semester and the second 8-week course in the middle of the semester would not work unless they had at least 12 hours prior to the second 8-week course. However, this would mean that a student would be required to carry a heavy course load just to participate in the 8-week courses.

**Financial aid solution:** The summer 2011 restructure of the Financial Aid Department has given a solid resolution to the challenges we were originally faced. In meeting with financial aid, it was decided that students must register for both 8-week courses at the beginning of the semester unless he or she is a new student. Financial aid pays for the entire semester’s classes.

#### Advising challenge:
Returning Pulaski Technical College (PTC) students are able to register themselves for classes without being seen by an advisor. However, because the 8-week courses are new on the PTC campus, students are not aware of the time commitment and work load that will be required. Therefore, we would not want a student with a full-time job, family and other responsibilities enrolling in a course without being advised.

**Advising solution:** The courses will be flagged as permission only to provide an opportunity for proper advisement into the course. The instructors want to make sure that all students enrolling are aware of the structure of the course.

#### Registration challenges:
To allow for different pre-requisites for students taking the 8-week course, the coding in Campus Connect would require a different course number. This would mean re-programming the system to recognize students who are trying to register for the 8-week Intermediate Algebra course vs. the 16-week Intermediate Algebra course.

Also, to allow students to register in the middle of the semester, it would require different roster certification dates.

**Registration solution:** The 8-week course is open to anyone that meets the requirements for enrolling into Intermediate Algebra (ACT 18-20 and COMPASS 33-49).

Students must register for both classes at the beginning of the semester.

#### Instructor pay challenges:
If a student registers for both courses at the beginning of the semester but does not pass the first 8-week course, they cannot take the second 8-week course. They will then have to drop the College Algebra course and possibly fall below their full-time status, or drop the College Algebra course and enroll in another Intermediate Algebra. If the student does this, we face the challenge of paying an instructor for a 3 credit hour course containing only 1-5 students.

**Instructor pay solution:** Administration has agreed to assist in working out how to pay instructors. There could be a mid-term contract when the second 8-week classes begin.

We have also discussed options for students that are not successful in the first 8-week course:

1. Re-enroll into the course in the second 8 weeks
2. Issue a refund/tuition credit

### Update Review

#### Project Accomplishments and Status

**Pulaski Technical College has chosen an important Action Project; indeed, the Carnegie Foundation recently drafted a report on developmental math in community colleges. In the report they state, “The placement tests provide ample evidence that students entering community colleges have difficulty with the procedures of mathematics. What is clear from our data is that the reason for these procedural difficulties can be tied to a condition we are calling conceptual atrophy: students enter school with basic intuitive ideas about mathematics. They know, for example, that when you combine two quantities you get a larger quantity; that when you take half of something you get a smaller quantity. But because our educational practices have not tried to connect these intuitive ideas to mathematical notation and mathematical procedures, the willingness and ability to bring reason to bear on mathematical problems lies dormant. The fact that the community college students have so much difficulty with mathematical notation is significant, for mathematical notation plays a major part in mathematical reasoning. Because these students have not been asked to reason, they also have not needed the rigor of mathematical notation, and so have not learned it”. You can find the full report at**

The Higher Learning Commission Action Project Directory 3 of 5 04/27/2012
It is clear in this Action Project Update that the Developmental Mathematics and mathematics Departments took care to organize the tasks at hand, create a timeline, and engage appropriate constituents in the planning efforts (AQIP Behavior #3: Understanding Stakeholder’s Needs). It is unclear whether students in the developmental math sequence were consulted during this process. Collaboration is an important AQIP Principle of High Performance Organizations, which PTC has apparently embraced, along with agility, communication, and involvement. AQIP Category #5, Leading and Communicating, is critical to the success and sustainability of this project. The College’s commitment to student success in developmental mathematics and the willingness and ability of the two academic departments to collaborate suggest a likelihood of project success.

### 2: Institution Involvement

**A:** This question asks **HOW** people were involved in work on this project. While a list of individuals was provided, their roles, responsibilities, accomplishments and efforts were not specified. No information was provided regarding motivation, communication, maintaining awareness of the project, or how key players were kept active and motivated.

### 3: Next Steps

**A:**

By not limiting the pilot classes to students within a select COMPASS or ACT range, Pulaski Technical College is providing an opportunity for all students needing the Intermediate Algebra course to fast track through both the Intermediate and College Algebra classes in one academic term.

There is emerging research which suggests that motivation and discipline are equally predictive of success in developmental coursework as test scores. Will students in the pilot course receive special advising or training regarding study skills?

The College is also encouraged to gather qualitative feedback from students participating in the pilot to add a formative component to their assessment of the project’s success (AQIP Behavior #3: Understanding Stakeholder’s Needs; AQIP Behavior #1: Helping Students Learn).

The pilot effort, which is planned for this fall, demonstrates agility, foresight, and a commitment to information and people – four key principles of High Performance Organizations.

### 4: Resulting Effective Practices

**A:** Communication can be tricky in initiatives such as this one, in which intellectual ‘territory’ is at stake. Making interdepartmental curricular decisions to impact students’ lives positively is a selfless, albeit sometimes challenging endeavor.

Pulaski Technical College should be commended for the nature of this collaborative Action Project, which served to break down important departmental silos in the spirit of helping students to succeed. As a result of this Action Project, fast-track courses are now planned in Developmental English, and College Algebra is being offered in an 8-week fast track format. These are student-centered decisions that exemplify all 10 principles of high-performing institutions.

### 5: Project Challenges

**A:** The financial aid challenge appears to have been overcome by making the two courses co-requisites within PTC’s registration information system, though this was not explicitly stated. This is a clever solution to the problem; however, what is the financial aid solution (separate from a refund or re-enrollment in the Intermediate course) for those students who do not pass the first 8-week course (Intermediate Algebra)? This could be a problem for students with a total course load of 12 credit hours, and is an important consideration (AQIP Behavior #3, Understanding Students’ Needs and AQIP Behavior #4, Valuing People).

PTC has been proactive and creative in identifying challenges and implementing preemptive solutions, such as requiring permission for students to enroll in the fall pilot course. In so doing, the likelihood of student success and retention in the pilot is increased.

The College should be congratulated for attaining the support and commitment of the administration for this project. By eliminating the partial pay threat that is inherent in the second course (College Algebra), the College has made success attainable for both the students and the faculty members involved.

The College is making reasonable progress toward completion of this Action Project. The Project will not be completed, however, until after the pilot course is run in the fall and the College has evaluated the measures of success that it set forth in the original project proposal, and refine its curricular approach to Intermediate Algebra accordingly.

If this project, when complete, generates positive energy about helping students to succeed in their developmental coursework, then...
that outcome itself will be cause for celebration.