



DATE: November 26, 2013

TO: Omid Pourzanjani, Vice President, Instruction & Student Learning  
Jeff Courchaine, Dean, Math & Sciences, Business & Social Sciences  
Pete Bouzar, Chair, Mathematics Department  
Gregg Carr, President, Academic Senate

FROM: Wes Bryan

RE: Math Program Vitality Review Proposal

First, I want to put this letter in a context. Math education and poor student performance are hot topics at both the state and national levels. There are concerns about underprepared students, maintaining high standards, teaching methodologies, and appropriate accountability measures. Nobody has been concerned about this more than our own math faculty. The math faculty at GWC has voiced their concerns, as well. As College President, I have wanted to help and we have been able to make minor changes. However, that is not enough and it is not simply a problem with math, it is a College challenge. It will take more than the resources of one department to meet this challenge. We must tackle this challenge straightforward. I believe there are two ways to help. The first will be to clearly identify the problems and some potential solutions. The process that has best been used for this has been Program Vitality Review, which brings College faculty from more than one division together to help. Secondly, there will be grant dollars to implement identified solutions and strategies.

This is somewhat of an unusual Program Vitality Review request. While it involves a single department, the request is not initiated because of any findings directly linked to the program review submitted by the department, nor is it recommended by the department faculty, chair or dean. While I have discussed this action with the Vice President of Instruction and Student Learning, this is an action being taken by me, as your College President.

The issue I am asking the PVR committee to address is larger than the Mathematics Department and the College. It is a state and national concern. Research from the Community College Research Center at Teachers College indicates that roughly two-thirds of new community college students place into developmental math and, of those students, fewer than one in four earn a degree or certificate within eight years (Bailey & Cho, 2010). Our College's data is similar to this finding. Fewer than 52% of our degree-seeking students eventually transfer and/or earn a degree after six years. This is not because the faculty doesn't care or hasn't tried hard to address this concern. Their efforts are admirable and their concern for students unquestionable. However, a single department cannot bear this heavy load alone.

Andrew C. Jones, Ed.D., Chancellor

The trending data is discouraging, if not, at times, demoralizing. It is easy to look for a single cause, like class size, poor preparation by K-12 partners, or students' poor work ethics. I am sure all of these and more are contributing factors to this downward trend. However, math is one of two gatekeeper disciplines for transfer and certificate completion. It impacts almost every student with an educational goal beyond self-improvement. With the state's recent limitation on repeatability and increased focus toward completion measures, we must be proactive in addressing every barrier to student completion, including math. For these reasons, I have elected to ask for HELP.

I am committed to working collaboratively to find solutions that are both effective and sustainable. I am also convinced that we cannot keep doing what we have been doing and expect to get different results. I am calling on the Department and the College to face this issue directly, with honesty, openness and a willingness to explore and/or try out multiple methodologies, course designs, platforms, course configurations, and teaching strategies. I also encourage the Department to consider adopting different math pathways that are more closely connected to the students' programs of choice, with content and competencies that are contextualized and applied.

Some of this has been started, but it does not yet have the status of an approved strategic plan that has wider campus input and additional needed resources. Clearly, the purpose of this PVR is to lead to program improvement (option #1). Options #2 (discontinuance) and #3 (suspension) are **NOT** on the table. I view this as an opportunity and it is not intended as punitive.

#### Transfer-Level Math – Five Year Trend

TRANSFER LEVEL	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012
	Avg Success	Avg Success	Avg Success	Avg Success	Avg Success
<b>OVERALL</b>	53.1%	55.9%	55.4%	60.1%	59.2%
<b>MATH 100</b>	49.4%	59.0%	61.7%	66.4%	65.4%
<b>MATH 104</b>	86.2%	68.8%	83.3%	87.9%	85.7%
<b>MATH 115</b>	53.0%	52.8%	35.7%	57.4%	39.2%
<b>MATH 120</b>	52.4%	60.9%	60.1%	51.1%	58.0%
<b>MATH 140</b>	60.5%	58.3%	65.3%	70.0%	63.8%
<b>MATH 150</b>	57.7%	66.7%			
<b>MATH 160</b>	37.7%	57.1%	51.5%	64.4%	70.4%
<b>MATH 170</b>	48.6%	49.2%	74.8%	65.6%	60.9%
<b>MATH 180</b>	63.2%	55.2%	59.8%	50.6%	61.9%
<b>MATH 185</b>	58.8%	52.3%	54.9%	56.1%	59.8%
<b>MATH 280</b>	56.3%	51.5%	67.4%	85.4%	50.0%
<b>MATH 285</b>	54.5%	50.0%			57.1%

### Remedial Math – Five Year Trend

REMEDIAL	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012
	Avg Success	Avg Success	Avg Success	Avg Success	Avg Success
<b>OVERALL</b>	43.2%	42.6%	44.7%	43.1%	44.6%
<b>MATH 005</b>	45.0%	46.3%	68.4%	51.2%	
<b>MATH 008</b>	49.5%	53.7%	48.4%	34.0%	
<b>MATH 009</b>	65.5%	68.4%	68.5%	75.8%	44.9%
<b>MATH 010</b>	35.9%	31.2%	34.0%	34.6%	44.7%
<b>MATH 020</b>	23.5%				
<b>MATH 030</b>	46.9%	47.2%	50.1%	47.9%	44.5%

These two data tables identify troubling trends in some cases showing very little change over time, while those in remedial are both critical and erratic and can no longer be tolerated; however, they also suggest that the different challenges may need different solutions. For that reason, I am also recommending that the Academic Senate consider forming two PVR teams: one that will concentrate their review efforts on remedial and developmental math (Basic Skills), and the other to address college-level mathematics, both general education courses and higher level mathematics. While there should be some cross-coordination, I believe the challenges are different, significant, and worthy of concentrated attention.

I will be making a proposal to Planning and Budget to place \$10,000 into a holding account for Spring/Summer 2014 to aid the committee in its work to identify successful strategies. These funds will be under the direction of the PVR committee and authorized in consultation with the Vice President of Instruction and Student Learning. They are intended to defray the cost of committee travel, research, product testing, and/or other activities and expenses the committee deems appropriate in their deliberations and development.

I am also asking that these research efforts be assisted by the Office of Research, Planning, and Institutional Effectiveness, as well as the Institutional Effectiveness Committee, as deemed appropriate.

Clearly, more resources will be needed in the future if the College is to meaningfully address the challenges many students across the state and nation are facing. I believe that these downward trends can be changed if we have the will, if we partner with others to identify potential solutions, and if we then dedicate the resources necessary to help our students be more successful, not only in math, but in completing their educational plans to transfer and/or enter the workforce.

#### **Primary Charge of the PVR Committee**

Based on findings and discussion, the committee will identify and recommend strategies that may have the potential to improve student success rates. I have attached a copy of the PVR committee process, and remind everyone that this is a private process, until the committee completes its report.

#### **Concerns**

In order to successfully address this charge, I am recommending that, at a minimum, the committee examine the following areas of concern with a data-informed approach and consider some of the findings and best practices of the resources identified below.

While this is not an exhaustive list, these elements will help inform the committee in defining problems and discussing strategies as they formulate their recommendations.

## STUDENT PERFORMANCE

### Student Success Rates

- Deeper analysis of the variance in success rates among instructors
- Deeper analysis of the variance in success rates in classes taught by a single instructor
- Deeper analysis of the variance in success rates in different classes and by student patterns of entry into those classes
- Deeper analysis of the variance in success rates based on time of day, term, and course length
- Deeper analysis of the variance in success rates based on course instructional methodologies
- Deeper analysis of the variance in success rates for similar courses at our college and comparative colleges
- Deeper analysis of the variance in success rates by class size, time in supplemental instruction, tutoring, online support, etc.

### Student Satisfaction

- How do students assess their experience in course(s) and program?
- What happens to a student who gets a substandard grade in a required math course – the wider unintended impacts beyond grade in course?
- What options are provided to students for contextualized learning, related to various majors and/or transfer clusters?
- What are some of the behavioral differences (study habits and interventions) between successful and non-successful students?
- What percentage of GWC students satisfy their math requirement at another institution?

### Program Size

- What is the annualized student demand for remedial courses?
- What is the annualized student demand for college-level math courses used to satisfy general education requirements?
- What is the annualized student demand for higher level math courses?
- What majors at the College require advanced-level math?

### Cost Effectiveness

- How do our operational expenditures compared to our peer institutions?
- What are the required investments in facilities and equipment?
- What are the potential economies of scale?
- What is the fiscal impact of various class size configurations (cost and impact on success rates)?

### Pedagogical Considerations

- Is the current Department practice of having every full-time instructor teach all course levels vs. assigning lead instructors to specific levels (custodians of the whole vs. custodians of an area) the most effective approach to addressing the variety of student needs?

- How should the College address the needs of students with math deficiencies greater than two levels below college math? i.e.: Should the College develop an adult school model/partnerships for this level of remediation?
- The committee should re-examine assessment practices (one test every two years, single score vs. diagnostic, multiple measures vs. high school GPA or grade in specific math course, testing with/out review or preparation intervention).
- Explore and recommend best practice options such as supplemental instruction, Summer Bridge, math refresher course, repair target deficiencies with gap analysis, adaptive learning and blended learning, Khan Academy, MyMathLab, open source supplemental resources, etc.
- Consider creating an analytical matrix to compare student success factors (class size, mode of instruction, type of supplemental instruction, full-time/part-time instructors, assessment score, grades in previous math classes, etc.)
- Special consideration should be given to supplemental course materials that are open source, scalable, provide solid diagnostics, have low or no fees and provide students unlimited access beyond the length of a single course.

These ideas are not comprehensive, they simply point in directions with both data and information that can inform the discussion. I would like to thank the department for their willingness to look at these challenges and this data with other colleagues, so that together your department can reshape math education and model strategies that successfully improve our College's student success rates.

Cc: Dean Mancina, President Coast Federation of Educators, Local 1911/AFT  
 John Dunham, Math Department Faculty Member  
 Antony Hoang, Math Department Faculty Member  
 Lindsay Lewis, Math Department Faculty Member  
 Douglas Lloyd, Math Department Faculty Member  
 David Marino, Math Department Faculty Member  
 Linda Ternes, Math Department Faculty Member

## Resources

Instructional Program Review – Math - Spring 2013

<http://goldenwestcollege.edu/wpmu/oir/institutional-effectiveness/program-review/>

Reengineering Developmental Math - Educational Advisory Board – June 2013

<http://www.eab.com/Research-and-Insights/Community-College-Forum/Studies/2013/Reengineering-Developmental-Math>

Algebra Doesn't Have to Be Scary – Atlantic October 2013

<http://www.theatlantic.com/education/archive/2013/10/algebra-doesnt-have-to-be-scary/280931/>

Basic Skills Completion – California Community College Chancellors Office – 2013

<http://3csn.org/basic-skills-cohort-tracking-tool/>

Completion by Design – Bill & Melinda Gates Foundation – June 2011

[http://completionbydesign.org/sites/default/files/CBD\\_Concept\\_paper\\_.pdf](http://completionbydesign.org/sites/default/files/CBD_Concept_paper_.pdf)

Achieving the Dream – [www.achievingthedream.org](http://www.achievingthedream.org)

Los Medanos College's Path25Stats (formerly StatPath) Curriculum Redesign

<http://losmedanoscollege-puente.facultyinquiry.net/>

California Acceleration Project (<http://cap.3csn.org>)

Carnegie Foundation for the Advancement of Teaching Statway and Quantway Pilot Programs

<http://carnegiefoundation.org/spotlight/webinar-introducing-carnegies-work-in-developmental-mathematics>

Long Beach City College Promise Pathways

<http://lbcc.edu/promisepathways/>

Sierra College Early Assessment Program

<http://www.scribd.com/doc/28325338/Sierra-College-Early-Assessment-Program-Slide-Deck>

Bailey, T. & Cho, S-W. (2010) Developmental Education in Community Colleges:

<http://www2.ed.gov/PDFDocs/college-completion/07-developmental-education-in-community-colleges.pdf>