

Golden West College Program Vitality Review Report

Program Name: **Remedial Mathematics** (note due to the length of the PVR process and immediate concerns regarding remedial mathematics, the transfer level courses will need to be reviewed separately in 2014-15.)

Reasons stated by VP of Instruction for placing program in PVR: The program was placed in PVR by the College President. The letter is attached to the report.

Committee validation of reasons stated for placing program in PVR:

Student Success Rates: The committee validated that student success rates were unsatisfactory.

Deeper analysis of the variance in success rates among instructors- (See Table 1)

There is a great variance of success rates among instructors. For remedial classes the highest rate of success by an instructor was 62.9% and the low 27.3%. Of the instructors that taught both remedial and transfer courses the success rates stayed fairly consistent with one exception. Instructors with high success rates in remedial classes had high success rates in transfer level classes and instructors with low levels of success in transfer classes had low levels of success in remedial classes.

Deeper analysis of the variance in success rates in classes taught by a single instructor- (See Table 2)

There is a great variance in success rates among instructors. Specifically focused on courses below transfer level the highest success rate for an instructor was 50.3% with the low of 29%. For Math 030 the highest success rate for an instructor was 63.4% with the low of 26%.

Deeper analysis of the variance in success rates in different classes and by student patterns of entry into those classes- (See Table 3)

For Math G030 the leading indicator for success was having passed Math G010 however there was no indication that successfully passing Math G030 led to success completion of Math G115.

- *The leading indicator of success in Math G115 was assessing into a higher level Math course.*
- *There was very little difference in success rates for all other means of entry.*

Deeper analysis of the variance in success rates based upon time of day, term, and course length- (See Table 4)

- *There has been a significantly higher success rate for students in summer verses Fall or Spring most dramatically illustrated in 2010-11 (the most recent year with completed date) when 54.8% of students successfully completed summer Math G010 verses 34.6% of Fall and 42.2% of Spring students successfully completed. The same year 61.1% of summer students successfully completed Math G030 verses 47.9% of Fall and 41.7% of Spring Students.*
- *A lesser overall pattern of success by semester for non-remedial courses from summer to fall to spring could be found and success varied course to course.*
- *Available data indicates that shorter more compacted courses held four days per week have had higher success rates than traditional 16 week two days per week courses.*
- *There was slight variation among success rates based upon the time of day the course was offered.*

Deeper analysis of the variance in success rates based on course instructional methodologies- (See Table 5)

- *Students had significantly lower success rates in Online Courses in Math G030 and G100 compared to Lecture/Lab. Overall rates of successful completion in Math G010 were low regardless of instructional methodology.*

Deeper analysis of the variance in success rates of similar courses at our college and comparative colleges- (See Table 6)

- *For remedial math courses, Golden West College students had similar success rates to Coastline College (without military) and significantly lower success rates than Orange Coast College.*
- *Success rates for GWC students enrolled in Math 010 were significantly lower than both Coastline and Orange Coast Colleges.*
- *Success rate for GWC students enrolled in Math 030 were significantly lower that students at Orange Coast College and significantly higher than students at Coastline.*

Deeper analysis of the variance in success rates by class size, time in supplemental instruction, tutoring, online support. etc. (See Table 7)

- *For remedial courses there is a significant drop in student success when the class was 2.0 LCF vs 1.5 LCF. There were no remedial courses less than 1.5 LCF.*
- *Overall for transfer level courses there is very minimal difference between sections of 1.0 and 1.5 LCF*

Student Satisfaction: There is no mechanism available at the college to measure student satisfaction. There was much discussion within the committee for the need to develop a student survey. However there was no consensus on the method or content of the survey.

Cost Effectiveness: See Step 2

Pedagogical Concerns:

The Need for Smaller Class Sizes in Remedial Mathematics at GWC

What smaller classes will make possible:

- Allows for greater student-student and student-instructor engagement through
 - collaborative learning
 - contextualized learning
 - supplemental instruction and use of best practices
 - group activities
 - peer-assisted instruction and learning communities
 - course redesign models (flipped learning)

- Allows for more holistic instructional and intervention methods through
 - assessment of student's level of under preparedness and basic skills deficiency
 - just-in-time intervention by the instructor in partnership with a counselor
 - use of motivational strategies and effective study skills
 - use of strategies to promote greater critical thinking
 - follow an inquiry-based model of instruction – including a combination of cooperative learning, direct instruction, labs or hands-on investigations, and manipulatives
 - connect to students' prior knowledge to make meaningful real-world applications

- Allows for a more comprehensive and sustainable remedial math program through
 - greater consistency and tracking of course and program SLOs
 - partnerships with high-schools to incorporate pre-assessment and bridge programs
 - counseling and early intervention models to promote student's successful course completion
 - establishment of a comprehensive math study center (Math Achievement Center – MAC)
 - training of faculty and staff

Class sizes that accommodate:

- * Incorporating activities to accommodate different learning styles
 - for visual learners:
 - show and assign videos/animation applets to demonstrate mathematical concepts
 - use multi-colored markers for lectures
 - for auditory learners:
 - have students present a problem to a small group of peers;
 - have students talk out the problems while they work
 - Create a rhyme/funny saying to memorize formulas and steps
 - use of videos/applets
 - for kinesthetic learners:
 - have students demonstrate problems on the board;
 - other group activities as appropriate
 - make up motions to go with steps in problems or formulas
 - “walk through” (map it out) the steps of a problem

- * providing them with corrective feedback on their work
 - able to more carefully assess learning outcomes and provide written feedback on written work submitted by students

- will lead to determining students at risk of not making satisfactory progress towards course completion and provide support services
 - Provides “personal touch” in instructor guidance to student
 - Creates a “talking point” for conversations between student and instructor
- * Instr/student planning of goals
- arrange to meet with at-risk students during office hours
 - get to know students’ math learning challenges and provide recommendations for greater likelihood of success
 - get to know students’ college and career goals and provide mentorship towards their goal attainment
 - Break down study strategies into “SMART goals”
 - Talk to students about setting goals, then goals to meet the primary goals, step by step
- * Increase student accountability by:
- (a) increasing attendance
 - (b) seek tutoring/instructional office hours
 - (c) class activities that demand student participation
 - encourage and track class attendance by collecting in-class worksheets/activities
 - notify student and counselor of excessive student absences and unsatisfactory progress
 - identify at-risk students and encourage tutoring, attend office hours, and other support services as appropriate
- * Interactive instructional methods
- Instructor guides student through the material rather than “lecturing”
 - “I do, you do” lessons. Instructor does example(s) first, then instructor talks through similar examples with students, then students do problems on their own while instructor walks around the room
- * Collaborative learning activities
- Projects to reinforce concepts learned in class
 - Extra worksheets (practice exercises)
 - Pairs/groups of 4, divided by different categories
- * Contextualized learning activities
- Use examples pertaining to different disciplines, focusing on the majors of the students in the course
 - Have students come up with problems they face in their line of work and discuss how to solve them
 - Choose problems from the newspaper/ internet relating to real-world situations
- * One-on-one interviews of each student with instructor
- Assign students to meet one-one-one with instructor as a homework assignment

- Talk to students about their goals, their learning styles, their study habits, etc.
 - Relate subject matter to interests of students
 - Student sees instructor as a person who is “part of their life”
- * Choice of presentation (white board/tablet PC /document camera)
- Ability to adapt presentation to material and/or learning level and/or type of students in the class.
- * Flip a section of Math 10/30.
- This involves a minimum of 200 hours per course put in by instructor to create videos and worksheets for the “lecture hour.”
- * Learning community with a counseling class:
- Counselor meets with students for study skills and math instructor identifies at-risk students

We then looked at the other options:

1. Schedule change to 4 day/week schedule
2. Math Study Center/ STEM Center with adequate staffing of qualified math tutors.
3. Instructor volunteers for tutoring in the Math Study Center
4. A dedicated math counselor involved with remedial math program.
5. We need an early alert/early intervention program combined with student ed planning.
6. A combo Math 08/10 and Math 10/30 section and pilot a section once approved through CCI.
7. Departmental final exam for Math 10/30.
8. Course coordinators coordinate SLO assessment, etc. As a department, there are remedial program guidelines.
9. Math Learning Skills Course (similar to Bio G205)
10. More adequate classroom learning environment:
 - a. technology
 - b. AC system upgrade
 - c. seating arrangement

Documents Reviewed:

GWC's most recent Program Review for Math

[The Effective Mathematics Classroom](#)

[Best Practices in Developmental Mathematics](#)

[Building Blocks of Success: Higher-level Math for All Students](#)

[Improving College Readiness of Community College Students](#)

[The Effects of Class Size on Student Achievement in Higher Education](#)

[Class Size Matters](#)

[The Impact of Class Size and Number of Students on Outcomes in Higher](#)

[Empowering Community Colleges To Build the Nation's Future](#)

[Guidelines for Assessment and Instruction in Statistics Education: College Report](#)

[Increasing Access to College-Level Math: Early Outcomes Using the Virginia Placement Test](#)
[A Review of Flipped Learning](#)

[Learning Environment Standard 17 Keys to Success in the Classroom](#)

[Advancing Student Success in the California Community Colleges](#)

[What Community College Developmental Mathematics Students Understand about Mathematics](#)

[Teaching Community College Mathematics: Unlocking the Variables](#)

Step 1—History and Current State of the Program

Brief description of the program:

A Brief History of GWC Basic Skills Mathematics Program

Basic skills Mathematics offerings at Golden West College are comprised of MATH G010 Elementary Algebra and MATH G0303 Intermediate Algebra. Historical scheduling data is displayed in the table below for fall 2008 through Fall 2013 (semesters for which data was available):

		# of	Census	AVG Class
		Sections	Date	Size
			Enrollments	
MATH G010				
Fall	Low	4	511	128
	High	6	651	109
	Avg	5.4	579	107
Spring	Low	4	456	114
	High	6	616	103
	Avg	5	539	108
MATH G030				
Fall	Low	6	710	118
	High	8	768	96
	Avg	6.9	725	105
Spring	Low	6	615	103
	High	8	803	100
	Avg	6.7	694	104

The table above displays that basic skills Mathematics sections have consistently enrolled 100+ students which is unprecedented outside of the Coast Community College District. In researching the advent of the current basic skills Mathematics practices Harvey Reynolds, the previous Mathematics Department Chair, was contacted. According to this source the department was experiencing difficulty with consistent standards and with instructors not adhering to the Course Outline of record (COR). The department's response to this situation was "to put as many students together as possible and select teachers who would all cover the same material and maintain standards". It appears the motivation for the larger class sizes was control of the curriculum and that teaching methodology was not a priority. In fact the source goes on to say that "We found the quality, but not the high pass rates".

The number of full time faculty members in the Mathematics department has been steadily decreasing since Fall 2008 (last term for which data is available). From a high of 11 full time instructors in spring 2009 this number decreased to 6 in fall 2010 through spring 2012. The number of full time instructors rose to 7 in Fall 2012 through spring 2014 but due to a failed tenure process will decline to 6 in fall 2014 and due to a pending retirement will fall even further to 5 in fall 2015 if no new full time faculty are hired in the department.

Comparison to Similar Programs

This comparison of programs will strive to compare apples with apples. The major basic skills programs currently offered at Golden West College are basic skills Mathematics, English and English as a Second Language (ESL). The program comparison will focus on basic skills Mathematics and English. Examination of available data shows that the two basic skills programs are similar in several ways; both offer courses two levels below college level (MATH G010 and MATH G030, ENGL G098 and ENGL G099). Both programs serve similar numbers of students per major academic term (fall and spring); Math basic skills averages 652 students fall and 616 students spring, English basic skills averages 616 students fall and 480 spring.

The areas where the two programs diverge are: number of full time faculty, average class size and success rates.

Number of Full Time Faculty

Since fall 2008 (the first term for which data is available) the number of full time faculty for each area are detailed in the table below:

	FT Faculty Numbers	
Mathematics	Highest	11
	Lowest	6
	Average	7
English	Highest	12
	Lowest	9
	Average	10

Since spring 2009 the number of full time English faculty has been higher than the number of full time Mathematics faculty, at the greatest the difference was 5 but never less than 2. A consequence of the lower number of full time faculty is the inability to monitor part time instructors and maintain a consistent instructional experience and quality across all courses and sections. It also means that there are fewer discipline specific trainers to aid part time instructors in learning and adopting innovative teaching methods.

Class Size and Success Rates

The two programs differ vastly in class size. Since fall 2008 (the first term for which data was available) the average basic skills class sizes were: Fall - English 31 and Mathematics 110, spring – English 29 and Mathematics 107, summer – English 29 and Mathematics 75. The data shows that basic skills Mathematics sections consistently enroll three times the number of English basic skills sections.

This disparity in class size is reflected in student success rates. Mathematics basic skills student success rates are on average 21% lower than English basic skills (Mathematics 41% avg English 62% avg).

Step 2—Program Demand/Value Added

Program Size:

What is the annualized student demand for remedial courses?

The annual demand for remedial courses is high with all sections of Beginning Algebra (Math G010: 6 sections) and Intermediate Algebra (Math G030: 8 sections) filling with class sizes of 90 each and having full waitlists. Many instructors add additional students based on their judgment to maintain effectiveness and provided there are adequate math lab computer stations available.

What is the annualized student demand for college-level math courses used to satisfy general education requirements?

The annual demand for college-level math courses (Math G100 through Math G170) has been steady as well with all sections filling and having full waitlists. There's been an increasing trend in students demand for Statistics (Math G160). In the last 3 years, the department has been able to add additional sections of Math G160; however, staffing these courses with qualified and effective instructors has been a challenge.

What is the annualized student demand for higher level math courses?

The department has noticed an increasing trend in the demand for higher level math courses (Math G180 and above). In the last 3 years, we have added additional sections of Calculus 1, 2, and 3 (Math G180, G185, and G280). Once again, the staffing of these sections with qualified and effective instructors has been a challenge. The department has recruited effective part-time faculty who are full-time faculty at other local colleges to staff some of the Calculus 1 and 2 sections. The department strongly feels that a full-time GWC math faculty should teach the Calculus 3 (or higher) sections. We currently have 3 FT instructors who have been taking on that responsibility each semester and an additional FT faculty who has agreed to rotate in and teach a section of Math G280 in fall 2014.

Below is an illustration of the demand for Math courses at Golden West College in comparison to the number of seats offered:

*Demand for Math Courses at GWC for Spring 2014 **

	Math 10	Math 30	Transfer-Level Math**	Higher-Level Math^
Number	1,966	2,090	2,262	719
Spring 2014 Seats Available	540	720	918	585
Percentage (Seats/Demand)	27%	34%	41%	81%

*The numbers presented in the chart only consider students who were enrolled at GWC in Fall of 2013. Thus, they do not count for additional demand imposed by continuing students who did not enroll in Fall 2013 but are planning to enroll in later semesters.

**Transfer-level math includes all courses with a pre-requisite of Math 30. Because there is no way to know which students will choose to take which college-level math course, we are unable to provide demand numbers at the course level. For the Spring 2014 Seats Available metric, Math G104 (36 seats) was excluded since it is specifically for elementary teachers.

What majors at the College require advanced-level math?

- Anthropology, AAT (Math G160)
- Biology, AA (Math G170 or G180)
- Business Admin., AST (Math G140 or Math G160)
- Chemistry, AST (Math G180)
- Comp. Sci., AST (Math G180 and Math G185)
- Geography (AAT): Math G160 (Elective)
- Geology, AST (Math G180 and Math G185)

Kinesiology, AAT (Math 160 as Elective)
Mathematics, AST, AA (a bunch)
Nursing, LVN to RN (Math G160)
Nursing, RN (Math G160)
Physics, AA (Math G180, Math G185)
Political Science, AAT (Math G160)
Psychology AA, AAT (Math G160)
Sociology, AAT (Math G160)

Step 3—Identify Direct or Root Causes of Program Performance Gaps

Direct or Root Causes of Program Performance Gaps include:

- Under Prepared Students
 - Poor Math skills
 - Poor College Success skills
- Low Student Engagement and Low Faculty- Student Interaction
- Students are not appropriately assessed and placed
- Lack of opportunities for staff development
- Low number of full-time faculty to serve students and facilitate programmatic consistencies
- Lack of support resources including proper tutoring resources for students
- Current teaching techniques do not match students' level of preparation and math foundation
- Challenges identified as perpetuating these causes include: large class sizes, lack of training available to faculty to apply new teaching techniques, lack of incentive for genuine change.
- Lack of diagnostic tools to identify student Mathematics deficiencies
- Lack of multiple measures to appropriately place and remediate basic skills

Step 4—Committee Recommendations

**Can the program be revitalized into a strong¹ program with minimal² financial resources?
If yes, how specifically? NO**

**Can the program be revitalized into a strong¹ program with substantial³ financial resources? YES
If yes, how specifically?**

The committee agreed on the following list of items to improve student success to be used **in conjunction** with a number of the additional recommendations listed below. No consensus was achieved on how if any of the items can be implemented. The committee was deadlocked at this point and may need external support to determine specific course of actions.

Agreed upon items: (list is unordered)

1. Alternative scheduling patterns (i.e. offering math 4 days a week instead of 2)
2. Appropriately sized classes to facilitates sound pedagogy and best practices
3. More accurate assessment measures and tool are needed as well as Pre-Assessment training and Post-Assessment Training (i.e. provide students with detailed information regarding the assessment process and the consequences of assessment)
4. There is a need to upgrade the Math and Science Facilities
5. Increase in tutoring resources
6. More full-time faculty

7. Staff development resources
8. Partnership with local feeder high schools
9. Need for Early Alerts with just-in-time intervention

Additional Recommendations without Consensus: (list is unordered)

1. Acquire of ALEX and/or other softwares that remediate identified deficiencies and increase student success
2. Adopt other possible methods of delivering instruction (e.g. flip the classroom, Activity-based learning, etc...)
3. Alternative math pathways (i.e. Statway)
4. Dedicated Mathematic counselor located in Math division.
5. Acceleration of basic skills math (i.e. combo classes)
6. Reorganization of all basic skills courses (English, Math, ESL) into a single division

Should the program be suspended? NO

I have read the 2014 Mathematics Program Vitality report and accept the conclusions as an accurate portrayal of the finding and recommendations of the committee.

() Al Gasparian (Co-Chair)

() Mitchell Alves (Co-Chair)

() Pete Bouzar (Math department member)

() David Marino (Math department member)

() Linda Ternes (Math department member)

() Darla Kelly (Academic Senate representative)

() Linda York (CFE representative)

() Kay Nguyen (ex-officio)

() Jeff Courchaine (ex-officio)

I have read the 2014 Mathematics Program Vitality report and wish to add signed comments to the appendices.

() Al Gasparian (Co-Chair)

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ADDENDUMS

I. A brief history of how this PVR process was conducted:

The PVR committee was established and convened to begin its work during Spring 2014. At first there was perhaps much apprehension and uncertainty on how this process was going to proceed. However, all committee members were focused on identifying root causes and identifying possible solutions to resolve issues within our control. There is no doubt that all committee members were primarily interested in achieving higher remedial math student success rates without loss of academic quality, rigor, and consistency.

Although the committee chair would bring an agenda with some topics for discussion to each meeting, several committee members were unaware and/or had false information on how the remedial math program operates. As a result, several initial meetings were centered on clarifying the placement test process and the history of the GWC remedial math program and the manner in which it operates to effectively manage the large class sizes. Midway through the spring semester, many committee members were becoming increasingly frustrated at the lack of progress towards identifying and resolving barriers to student success in remedial mathematics at GWC.

At this point, the committee began to utilize a strategy similar to “interest-based negotiations” to move us forward. This strategy proved to be very helpful in bringing a more focused and structured method to identifying the issues and possible solutions along with constituency groups that would need to be involved in the process of solution implementation. After a few more productive meetings, the committee became aware of the existence of PVR process guidelines, report forms, and a website where we could access previous PVR reports for reference. It was disappointing to many committee members to find out this information so late in the process. Yet, we moved forward with the understanding that a written report would begin to take shape. Pete Bouzar and Linda Ternes began to research and write in outline form several pedagogical and best practices for remedial level mathematics. (See attached “The Need for Smaller Class Sizes in Remedial Mathematics at GWC.”)

At the end of the spring semester, with perhaps only one more PVR meeting scheduled, the committee became aware that the PVR guidelines called for a faculty co-chair. With agreement and unanimous consent, the committee elected Mitch Alves as the co-chair. A final meeting was scheduled in which Al, Jeff, and Linda T. agreed to meet to begin writing the framework for the PVR report. Linda’s part in the meeting was to serve as scribe and help organize the information from the minutes of the PVR committee meetings throughout the semester. The committee was sent a draft of the PVR report in July 2014 (during summer break). In August 2014, in the first week of the fall 2014 term, the committee was informed that the final draft of the PVR report was uploaded in Dropbox and asked to sign the report. Since many of the committee members were not around during the summer and not obligated to continue working on this PVR process, there was a request to have a final meeting to clarify and make corrections to the report and provide additional comments/attachments prior to signing the final report. This meeting is scheduled to take place on September 2, 2014.

II. The GWC Mathematics Department response to this PVR process/report:

The GWC Mathematics Department continues to face many challenges out of our control. These challenges include many students who come with low levels of college preparedness, in need of mathematics basic skills remediation, and lack of thoughtfulness to better prepare themselves for

college-level course work. These challenges are further exacerbated by a shortage of full-time math faculty, increasing number of high-demand courses which typically are set as Large Class Factor (LCF: 55 students or more), and inadequate facilities and support services for our students. Yet we continue to face these challenges with an open mind and dedication to our students and their success without giving away academic quality and rigor.

We continue to employ and train qualified part-time faculty to manage and provide effective instruction in our list of offered courses, many of which are at the remedial level and LCF. As these instructors gain more experience, they are quickly hired as full-time instructors by other surrounding colleges and we are forced to go through a hiring process for qualified part-time faculty again and again.

For the Fall 2014 semester, all mathematics courses are taught by 6 full time instructors and 26 part-time instructors, a ratio which strongly challenges the preservation of the quality and integrity of the department. Only 2 of the 14 remedial math sections are taught by full time instructors. Again, the preservation of quality in our program is a monumental task.

Our remedial mathematics program continues to be a highly coordinated effort by all instructors to bring more consistency to the course and program student learning outcomes. We have incorporated an online course management and resource program, called MyMathLab (by Pearson Publishing), which has proven to be effective in managing the large class sizes and provides many resources for content mastery for students to take advantage of at a lower cost than just the price of a textbook with little to no additional resources. However, as with many online resources, the program has some downsides and requires higher levels of student dedication and accountability to make effective use of its available resources. Each semester we receive positive student feedback on the usage of this program and some not so positive feedback. The math department is open to exploring other online resource programs that can prove to be beneficial for student learning and/or the possibility of not using computer-based programs, provided the class sizes are reduced to more manageable numbers. Additionally, we are open to exploring alternative course scheduling patterns, partnerships with local high-schools to provide intensive remediation programs and incentives, and other appropriately thought out services. However, the analysis of data for the remedial math courses repeatedly validates the fact that the larger class sizes are related to lower student success rates (see Math Dept. Program Review – 2013 and this PVR report).

Throughout this PVR process, the math faculty continued to have an open mind and provide feedback as to possible changes and solutions, provided we have more full-time math faculty, faculty/staff development, and adequate facilities and resources. We are dedicated and hardworking individuals who want to see our students be more successful and our programs become stronger. But we also have our core values and philosophies about mathematics education and what we consider to be “student success”. There seems to be a disconnect with what we would consider student success and what GWC administrators consider as student success. Unfortunately, what has been passed down to us is the idea that “student success” is a C or better in a course, and the more C’s and above you have, the better teacher you are.

Since mathematics is probably the best example of a sequence-driven program, the idea of success needs to take on a different meaning. Therefore, we would like to add the following COPY from the website of the LARGE community college district Linda Ternes visited in Houston, and would like to urge the administration to take an honest look at this document, which comes from months of painful reviews and conversation:

Copied and pasted directly from the Lone Star College website, the following document lists the system's beliefs about student success. (See <http://www.lonestar.edu/about-lsc.htm> under "Resources.")

**What We Believe About Student Success
Chancellor's Ad Hoc Committee on Student Success Proposed Final Edition,
April 11, 2011**

1. **We believe**, in the context of a community college, student success means that students achieve their individual goals as participants in the college community.

Commentary: Students enroll in a community college for a vast array of reasons. For some, their goal is graduation with an associate's degree or certificate. However, if we operate on the assumption that graduation is the goal of all, or even most, of our students, we will mistakenly label as failures a large number of students who are completely satisfied that their experience with us has been a success. These students take classes at a community college to accumulate a few credits to transfer to another college or university, to improve specific skills for the workplace and/or to enhance their knowledge/skills for personal enrichment. All efforts to understand, measure and promote student success must respect and honor this array of goals. Furthermore, students do not necessarily commit themselves to one college for all their classes. Many swirl through several colleges gathering the credits they need from each. It must be considered that, although a student may not complete his or her goals at a given college, that college has still made a meaningful contribution to student success.

2. **We believe** the community college plays a vital role in assisting and guiding students in setting goals that are realistic and attainable and yet challenge the students to achieve their full potential.

Commentary: Many community college students begin with no clear goal in mind at all. Others come with goals that are unrealistic or, at the least, fail to acknowledge that a great deal of background work will be needed before the goals can be achieved. Still others, often first generation students, are unaware of the many possibilities open to them and set goals that are lower than their full potential. For all of these students, clarifying realistic and attainable goals is itself the first milestone of success. The college community, through advising and counseling and the mentoring of faculty, plays an essential role in helping students to articulate these goals.

3. **We believe** successful community college students operate on time lines that do not match traditional expectations, and that understanding student success should include recognition of completion of specific short term steps on the path to long term goals.

Commentary: Most measures of success that are applied to higher education put a time line for success at 1.5 to 2 times the traditional expectations. For example, graduation rates for bachelors degrees are often measured within a 6-year time frame. Community college students, as distinct from students at four-year institutions, are more often balancing work, school and family obligations and these situations require them to move at a slower pace—which in fact actually improves their probability of achieving their ultimate goals. In addition, some community college students begin with a profound need of remediation, so that more than one semester may be needed to pass a single class—and this initial time must be added to the arc of these students' journey towards graduation, transfer or other goals. Advisors and faculty play a key role in helping students set realistic short term goals that take these factors under consideration and that will help students stay on track towards achieving their long term goals.

4. **We believe** student success requires a healthy partnership between administrators, support services, faculty and students, each taking responsibility for their respective roles.

Commentary: A college that states that it is committed to student success is obligated to provide the highest quality of instruction possible (at both the college level and the developmental level) and robust support services. Highly qualified, innovative and dedicated faculty have a profound impact on students' futures. Effective advising, counseling, tutoring, mentoring, financial aid, student activities and other support services each play an important part in positioning students to maximize their performance. Administrators provide the resources and environment for faculty and staff to perform their roles effectively. However, it must also be understood that the ultimate responsibility for learning resides with the learner. Students can only learn successfully if they actively respond and persistently engage in the requisite activities prescribed by faculty, staff and administration. They must develop effective study habits, implement strategies to meet course outcomes, utilize support services as needed, and update/revise goals along the path to completion – all within the framework of regular, timely contacts with the college advisor(s). The college plays an important role in helping students develop these behaviors. However, any attempt to understand, measure and promote student success should take into consideration that some students will choose not to engage.

5. **We believe** student success is maximized when students are challenged to achieve high standards of excellence.

Commentary: In helping students understand how to set and achieve goals, one of the assumptions that the college community needs to try to help students put aside is the notion that just getting by is good enough. Whether students plan to transfer to a four year school, to enter the workforce directly or to pursue other endeavors, the college must prepare them for a very competitive world in which the best prepared have the best chance of success. Therefore, our standards for students should be high. But, historically, efforts to measure student success have, in some places, had the unintended consequence of compromising these standards. For example, in situations where grade distributions or test scores have been used as the measure of success, faculty have sometimes felt pressure to lower expectations to inflate scores. The college can avoid this effect by clearly and consistently articulating its support for high expectations and by choosing a broad array of measures that focus on all aspects of student success.

6. **We believe** student success is the core mission of the Lone Star College System. It is vital to the achievement of this mission to gather data to research our effectiveness and to learn from the data we find. As our students are diverse in their goals and experiences, an array of new measures will be required to address this diversity.

Commentary: The most commonly used measures of student success, grade distributions and graduation rates, are useful but do not capture all the aspects of student success. The “momentum points” proposed by the Texas Higher Education Coordinating Board, including pass rates in developmental and first college level Math and English classes, completion of 15 or 30 hours as well as graduation rates, go farther but focus student success on only two disciplines and still fail to capture the diversity of students' goals. Additional data exists and new measures should be implemented including a careful documentation of students' individual goals and their achievement thereof.

III. Additional points of clarification and context:

As math faculty members of the PVR committee reviewed the final PVR report, several areas of concern were identified, stemming either from faulty or incomplete information. Following are comments addressing these concerns.

A. Analysis of success rates

During the PVR process, members of the mathematics faculty identified possible information that could confuse data presented to us for consideration in our meetings and discussions. The confusion would result from the fact that some of the data in the CCCOC for remedial mathematics does NOT include Math G030, Intermediate Algebra, since this course is a requirement for any AA degree in the California Community College system. However, the data presented in PVR included Math G030, as well as faulty information of the modality of delivery of remedial math courses at GWC. The representatives from the Office of Research, Planning, and Institutional Effectiveness then corrected the data that was identified as suspect in the delivery modality.

The math faculty also stated in a meeting that a protocol should be developed for decision making regarding basic skills, remedial mathematics courses, and the GWC math department, due to the fact that the use of Math G030 data has not been officially defined at the college and/or district. However, no decision regarding such policy was communicated to the mathematics department or the PVR committee.

There seems to be some contradictory statements made in the analysis of data relating to the “Deeper analysis of the variance in success rates among instructors” and the “Deeper analysis of the variance in success rates in classes taught by a single instructor.” In the first analysis, it is stated that “*For remedial classes the highest rate of success by an instructor was 62.9% and the low 27.3%*” which contradicts the statement in the second analysis stating “*Specifically focused on courses below transfer level the highest success rate for an instructor was 50.3% with the low of 29%.*”

Where the report addresses an analysis of the variance in success rates based upon time of day, term, and course length, the math faculty agrees with the finding that “shorter more compacted courses held four days per week have had higher success rates than traditional 16 week two days per week courses.” However, no mention is made of the fact that the “shorter more compacted courses held four days per week” are only offered during summer session (7 weeks) or winter session (4 weeks). In both cases, the vast majority of students enrolled in a mathematics course are focusing on only one course, and are enrolled in a class that has a smaller size (for remedial math courses) than the traditional semester courses. The findings mention in particular the 2010-11 school year, comparing Summer to Fall and Spring semesters of that year. In both Summer 2010 and Summer 2011, remedial math courses were set at 90, while a large majority of remedial classes had a LCF of 180 in both Fall 2010 and Spring 2011, with a handful of Math 30 set at 90. In recent years (2013-2014), the summer session remedial math courses were set at 36 but no analysis of success rates is provided.

In addition to these variables, there is the fact that more non-GWC students enroll in the non-remedial courses during summer and winter, many of them coming to us from the universities and four-year colleges. These students have different backgrounds and preparation than most of our GWC students, and therefore the success rates statistics for non-remedial math courses in the summer and winter sessions may not be valid for GWC decisions concerning the mathematics department.

Deeper analysis of the variance in success rates of similar courses at our college and comparative colleges should also include a comparison of class sizes and the number of full time instructors for those courses. Otherwise, a comparison is made of apples to oranges, and an analysis of the variance in success rates is not statistically sound.

Lastly, when mention was first made of the final version of the PVR report, some typos were found. In case they have not been corrected, the use of “LHE” vs. “LCF” in the last piece of the “deeper analysis” in the PVR report is incorrect.

B. Program Demand/Value Added

While the information included in this area of the Mathematics PVR report is of great value to any recommendations and decisions made regarding the program, further review of the report has turned up some additions and corrections.

The chart for Demand for Math Courses at GWC for Spring 2014 has some faulty information in the data. The numbers in the last column “Higher-Level Math,” are turned around. The number should be 719, and the Spring 2014 seats available should be 585. Otherwise, the percentage of Seats/Demand is not 81%.

Secondly, the mathematics department believes that ALL GWC majors requiring transfer-level mathematics should be considered when examining the program demand/value added. Therefore, after consulting CurricUNET, the following GWC majors were found to require (and/or list as an elective) a transfer-level mathematics course. For clarification, the course is listed next to each major.

Anthropology, AAT (Math G160)
Biology, AA (Math G170 or G180)
Business Admin., AST (Math G140 or Math G160)
Chemistry, AST (Math G180)
Comp. Sci., AST (Math G180 and Math G185)
Geography (AAT): Math G160 (Elective)
Geology, AST (Math G180 and Math G185)
Kinesiology, AAT (Math 160 as Elective)
Mathematics, AST, AA (a bunch)
Nursing, LVN to RN (Math G160)
Nursing, RN (Math G160)
Physics, AA (Math G180, Math G185)
Political Science, AAT (Math G160)
Psychology AA, AAT (Math G160)
Sociology, AAT (Math G160)

Additionally, a quick CurricUNET review was made of the program demand for GWC majors for English, Biology and Ecology, Geology, History, Psychology, Sociology, Business/Acctg/Management, Chemistry, and Communication Studies. A chart was made of the GWC majors requiring transfer-level (not necessarily advanced level) courses from these programs. The results pointed conspicuously to the fact that mathematics supports more GWC majors than any one of the afore-mentioned departments. In fact, after mathematics (supporting 15 GWC majors), the next highest number of GWC majors supported by any department’s transfer-level courses was six, supported by Chemistry. Yet mathematics has the largest class sizes, smallest number of full time faculty members, and highest enrollment of any department at Golden West College.

C. Committee Recommendations

In general, the mathematics faculty members of the PVR committee agree with the recommendations listed as “agreed upon items” in the PVR report. The mathematics faculty are dedicated professionals who seek to promote and facilitate student success, developing meaningful relationships with the students enrolled in our classes, and becoming actively engaged in campus-wide efforts to improve school spirit and loyalty.

As to the recommendations without consensus, the following explanations address our concerns.

First, the acquisition of ALEKS (typo in the PVR report) and/or other software programs that remediate identified deficiencies and increase student success is NOT something the faculty opposes. On the contrary, remediation and identification of deficiencies will help increase student success if acted upon in a thoughtful and purposeful manner. In order to follow through with this recommendation, we would need a cohesive, well-established plan developed with the full support of the Mathematics Department, that would support the college’s mission as well as the values adhered to by our faculty. (See the “What We Believe about Student Success” document in the Addendum to the Mathematics PVR Report.)

Second, we are concerned about “adopting other possible methods of deliveries” without the input and participation of mathematics faculty in establishing those methods. Following Linda Ternes’ trip to Houston to observe classrooms where the “flipping the classroom” model had been piloted and developed, several discussions took place in the PVR meetings and also informally with mathematics faculty. The overwhelming stance of the math faculty is that any changes in “delivery” must be well thought out, constructed with the input and full support of the mathematics faculty, and in accordance with the philosophies of the college as well as the department. Again, the faculty is not opposed to researching and/or implementing other methods of delivery of instruction, as long as the previously stated parameters are kept in place.

Third, we are opposed to alternative math pathways (i.e. Statway/Quantway). During our PVR meetings, Mitch Alves, Dave Marino, Pete Bouzar, and Linda Ternes all expressed their very strong concerns about a recommendation of this nature. Unfortunately, none of that information or reason for opposition has been included in the Math PVR report, and we are confused and disappointed that the fact that this is a very contentious topic has not been clearly stated in the final report.

Fourth, we are not quite sure why the fact that we recommend a dedicated math counselor be located in close proximity to the mathematics division is presented as a recommendation without consensus. The only justification for this might be that the counselor member of our PVR committee was not in agreement.

Fifth, the mathematics faculty do not fully support the acceleration of mathematics courses (i.e. combo courses) for several reasons. During the PVR semester, Linda Ternes thoroughly researched each California community college’s mathematics offerings during the last two semesters, comparing the following categories: class size, types of courses offered, delivery, and number of sections. Although this report was shared with the PVR committee, the focus in the ensuing discussions seemed to be on class size comparisons. However, class size was only one variable. The class offerings variable provided some surprises as well. For example, Linda’s report (in the Math PVR Dropbox) shows that more colleges have resorted to extending the remedial math courses (for example, Math 10 in two semesters, Math 30 in two semesters), than to combining them into one class. The colleges that have

developed combo classes have courses that are of more unit value (6-8 units). This precludes students from taking more than two or three courses during any one semester.

In addition, very few colleges (a handful) have resorted to offering an alternative to Intermediate Algebra (such as Statway or Intermediate Algebra for Liberal Arts) for many reasons, one of which is the fact that such an alternative affects the articulation of subsequent courses in many departments. This is particularly dangerous when we consider ADTs (formerly AATs and ASTs). In the C-ID reviews of course outlines of record for Mathematics, reviewers have been instructed to “dig deeper” and look up course outlines and prerequisites from courses where Intermediate Algebra is listed as a prerequisite for that C-ID descriptor. Therefore, the course outline for Intermediate Algebra is of major concern to the mathematics faculty, as we want to avoid jeopardizing the articulation agreements of courses to any college, and most importantly, the C-ID articulation of our GWC STEM courses.

Sixth, the mathematics faculty have serious concerns and reservations in fully supporting the reorganization of all basic skills courses into a single division. We are concerned about FSAs of faculty hired to teach in such a reorganized environment, the success of students entering our transfer-level courses from such a division, and the preservation of the integrity of the mathematics curriculum once it leaves the purview of the GWC mathematics department. Furthermore, this model of a separate basic skills divisions has the potential of creating a more disjointed and unbalanced ratio of full-time and part-time math faculty in the two divisions.

In conclusion, the GWC Mathematics Department will continue to seek ways in which we can make progress towards greater consistency and student success rates in our courses and programs. We are open to more honest and productive dialogue that will help us strengthen our programs and provide our students with the best quality education and support services. We are hopeful that our Program Review document and this PVR report will further convince college administrators of our need for more full-time math faculty, smaller class sizes (especially in remedial level mathematics), and more effective facilities and student support services.

Respectfully,
Pete Bouzar and Linda Ternes