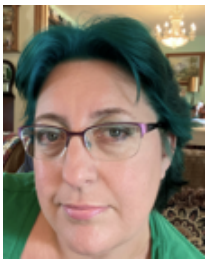
50th Volume!

President's Report

Jen Carlin-Goldberg, Santa Rosa Junior College



Greetings my fellow Mathematics Enthusiasts! I have been the President of CMC³ for more than a year now and it has been very different from what I expected. I have found my time spent serving CMC³ very rewarding. It has stretched me in new ways as we needed to adjust and change to meet these challenging times head on. I challenge you to consider joining our Board as is time for CMC³ Board election nominations. Consider joining this dynamic group of people in our mission to serve California community college mathematics faculty and students!

Last December we put on our annual fall conference in a virtual format for the first time. The conference was a fabulous success, I hope you were able to attend. I thoroughly enjoyed the talks, especially our two keynotes, Jessica Bernards and Dr. Brittany Mosby. In what is perhaps a sign of the times, one of the things that stood out for me was the cocktail hour while our Foundation President, Katia Fuchs, demonstrated how to make our keynote cocktail, the ZOOMTini. (The recipe is still on our Fall 2020 conference site.)

I am very proud of the brave members of our board who made the decision to put on the Fall Conference even though we could not know at that time just how busy we were going to be both in our personal and professional lives. This was so outside of most of our comfort zones, you might forgive us for harboring some small doubts over whether we could pull it off! James Sullivan, our President-Elect deserves so much credit for its success. He is truly an asset to our organization.

If you were not able to attend our virtual conference last fall I hope you will join us virtually April 24 for our 2021 Spring Conference which will be a fun break from our usual routines. Our keynote speakers are Dr. Marion Campisi from San Jose State University who will speak on gerrymandering and the 2020 US Census and Dr. Elena Fuchs who will take us on a journey from ancient geometric constructions of Apollonius of Perga from about 300BC all the way to quantum computers of the future. Though this spring conference will be a more modest affair than our usual conferences, I know it will be a worthwhile and enjoyable one.

(See "President's Report" on page 3)

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Call for Nominees

Please consider joining the CMC³ Board

Contact Past President Katia Fuchs if you are interested. (Look above for contact information.)

President's Report

(Continued from page 1)

As some of you have seen on our social media feeds, (please consider following us on Facebook and Twitter!) we are encouraging students to submit a proposal be our featured student speaker! The student speaker gets a scholarship from our Foundation, along with the experience presenting a mathematical topic of their choice. If you have a student who would make a good candidate, please go to http://www.cmc3.org/students/speaker/ for more information and for a link to the online proposal form.

Though we could not be together face to face in Monterey last fall and we cannot visit Tahoe this spring, the virtual conferences are still great opportunities for community college mathematics faculty to see what is happening in their profession and to interact with each other. We had more people attend the Fall 2020 Conference than we have had in a long time. Faculty came from all over California and beyond, many who had never come to our conferences before.

For a large number of reasons related to COVID, we have decided to host the Fall 2021 Conference virtually once more.

For now, as we are deep in our winter quarters and spring semesters I hope all of you stay safe and well and I look forward to "seeing" you all at the Spring Conference April 24!

48th Annual (First Ever Virtual) CMC³ Fall Mathematics Conference Wrap-Up

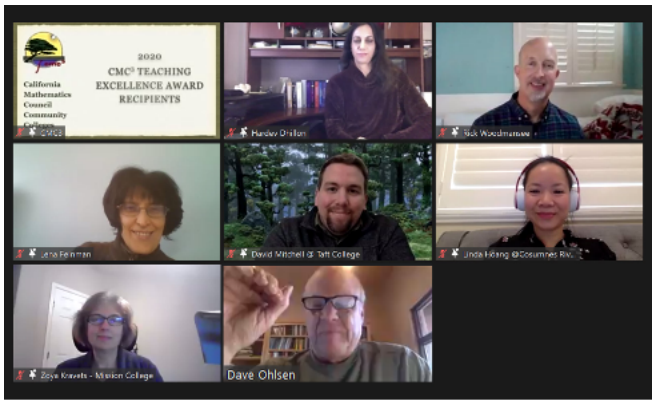
James Sullivan, President-Elect/Fall Conference Chair, Sierra College

The 48th annual CMC³ Fall Mathematics conference took place virtually via Zoom on Friday, December 11, 2020 from 4:45 pm to 7:30 pm and Saturday, December 12, 2020 from 9:30 am to 2:15 pm. Registration was free and included one year of membership in CMC³. We realize that attending another Zoom meeting at the conclusion of one of the most challenging and exhausting terms in our teaching careers was a big ask. So, we would like to extend our gratitude and appreciation to each and every one of the dedicated professionals (218 on Friday and 251 on Saturday representing 28 California Community Colleges and 22 other institutions) who attended our first ever virtual conference.

We also extend our gratitude and appreciation to our wonderful and impressive speakers (Jessica Bernards of Portland Community College, Dr. Brittany Mosby the Director of HBCU Success at the Tennessee Higher Education Commission, Guillermo Alvarez of Cuesta College, Mike Greenberg of City College of San Francisco, Barbara Illowsky of De Anza College, Ying Lin of Santa Rosa Junior College, Pat McKeague of XYZ Textbooks, Richard Rasiej of Santa Monica College, Kevin Shryock of Northern Illinois University, Donna Smith of Sierra College, Michael Sullivan of Joliet Junior College, and George Woodbury of College of the Sequoias) for sharing their valuable expertise with us and contributing greatly to the success of our conference. Links to resources and presentation

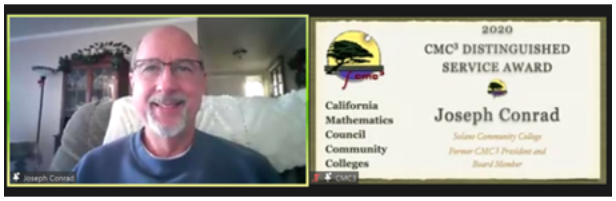
handouts shared by our conference speakers can be accessed on the CMC³ website.

The 2020 CMC³ Teaching Excellence Award recipients were announced during the conference. We congratulate Hardev Dhillon



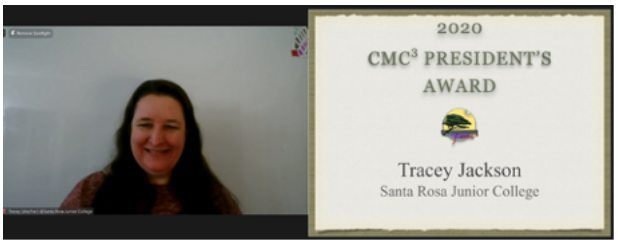
of Modesto Junior College, Lena Feinman of College of San Mateo, Linda Hoang of Cosumnes River College, Zoya Kravets of Mission College, David Mitchell of Taft College, Dave Ohlsen of Santa Rosa Junior College, and Rick Woodmansee of Sacramento City College on receiving the CMC³ Teaching Excellence Award. These outstanding educators were recognized for their contributions to their departments and devotion to their students.

Joseph Conrad of Solano Community College was presented with the 2020 CMC³



Distinguished Service Award. He was recognized for his many years of dedicated service and significant contributions to CMC³. Joseph has served as CMC³ President and CMC³ Membership Chair, and he writes the *History Corner* article for the CMC³ Newsletter.

Tracey Jackson of Santa Rosa Junior College was presented with the 2020 CMC³ President's Award for her outstanding work on the CMC³ Board. She is a long time CMC³ Board member and current CMC³ Secretary.



Tracey tirelessly lends her talents and support to making CMC³ a better professional organization for all of us.

I will conclude this conference wrap-up by expressing my sincere thanks to each and every member of the CMC³ Board for all of their time, energy, and effort in planning, organizing, and facilitating our first ever virtual conference. We did our very best, under trying circumstances, to make this conference meaningful and successful. We feel that we were, for the most part, able to accomplish our goals, but we do realize that some aspects could have been improved. So, we are grateful for the grace, understanding, and continued support of CMC³ exhibited by everyone who attended the 48th Annual CMC³ Fall Mathematics Conference.

Update Your Calendar:

Spring VIRTUAL Conference
April 24, 2021

Fall VIRTUAL Conference
December 10-11, 2021

24th Annual CMC³ (Virtual) Spring Recreational Mathematics Conference

Larry Green, Lake Tahoe Community College

Although I would love for us to be back to normal where we can all get together in a crowded room and enjoy recreational math, we are not quite there yet. The good news is that we will still be able to enjoy recreational mathematics together, just in the virtual environment that we are all used to by now. The CMC³ Recreational Mathematics conference will take place via Zoom on April 24. We will still be able to enjoy recreational mathematics talks and see each other, at least on the screen. We have an outstanding line up of speakers who will thrill us with super cool applications.

The conference will start out with a welcome and a game where everyone will try to identify specifically where pictures of the Lake Tahoe area were taken and note if you have personally been there. Then we will be entertained by Dr. Marion Campisi from San Jose State University who will show us how mathematics has been used to help us identify gerrymandering by those in power and how to mathematically find a fair redistricting method. We will just need to convince those in power to listen to the mathematicians. After this talk, there will be a series gambling games where we all will have to decide whether it is mathematically better to be the player or the casino for each game. Although the conference will not be in Tahoe for just about everyone except myself, we are trying to keep the Tahoe flavor. The gambling game will be followed by an amazing presentation by Dr. Elena Fuchs who will take us on a journey from the geometry of 3000 BC to the number theory of quantum computers of the future.

The virtual conference will close with a mathematics presentation by this year's Tahoe Student Speaker. If you have a student who may be interested in being this year's Tahoe Student Speaker, please encourage them to apply. The committee will begin reviewing the applications on March 31. Students can apply online at: http://www.cmc3.org/students/speaker/. There is an associated scholarship that comes with it. Students can also receive a half unit of college credit if they register for the associated applications of mathematics course, MAT 119, at LTCC which is basically a course that just involves virtually attending the conference. For more information about this class, please contact me at DrLarryGreen@gmail.com.

We are still working out the details of registration, but all the information about how to register for the conference will soon be found on the CMC³ webpage at http://www.cmc3.org/. We have decided that there will be no charge for attending the conference, but we strongly encourage everyone to donate to the CMC³ foundation whatever we all can in place of the normal registration fee. I look forward to virtually seeing you all on April 24 as we experience recreational mathematics.

Math Nerd Musings: 50th Volume!

Jay Lehmann, Editor, College of San Mateo

It's wild to think that this newsletter has reached it's 50th volume! So many wonderful thoughts not only about mathematics but also about great speakers, networking at conferences, student poster sessions, student scholarships, history of math and this organization, technology, and so much more. I've been honored to have reached my 20th year of serving as editor.

Little did I know that when Randy Taylor asked me to take on this position that I'd stick with it all this time. Randy was epically fired up, envisioning that the newsletter could bring back two popular features: the What's Happening articles about math departments and the Pleasures of Problems. Joe Conrad and Dick Basinger kindly agreed to author the Pleasures of Problems column (then called the Brain Strain). After Dick withdrew Joe continued for many years until Kevin Olwell took over when Joe had to juggle other duties including taking part in the six-year journey of serving as President-Elect, President, and Past-President. Joe, Dick, and Kevin have wisely supplied problems for us to solve with a wide variety of topics and challenge.

I believe we have the best newsletter of any CC math organization in the country. The only credit I can take for this is in assembling a fantastic group of columnists.

The What's Happening articles have always been a favorite for many readers. I'm grateful for all our members who have stepped forward to share about innovative programs and other developments in their departments.

I believe we have the best newsletter of any CC math organization in the country. Sure, I'm biased, but if you Google other CC math organizations websites, you'll draw the same conclusion. The only credit I can take for this is in assembling a fantastic group of columnists. I believe a newsletter is only as good as its columnists. Any CC math newsletter is going to have announcements and wrap-ups about conferences, but it's the columnists that add great dimension and color to a newsletter.

Take Dean Gooch's articles that span from fascinating mathematical adventures in India to his book reviews of girls and math. Or Ken Brown's longstanding column that included varied topics such as analysis of math textbooks, statistics pedagogy, and active learning.

Hal Huntsman, a fairly new columnist, has added depth to the newsletter by challenging us to consider non-mainstream ways to teach, grade, and relate to students. I don't always agree with his positions, but I'm impressed by the level of research he devotes to such topics, and he always challenges me to rethink what I've been doing in the classroom for the past 30 years —always a good thing! In fact, I would love for the newsletter to stretch in yet more directions, expressing contrasting views on education.

Jeff Anderson, our newest columnist, has shared with us about technology, which is timely

with all the remote instruction we are all doing. Jeff has many more ideas for articles and I'm curious to see in which direction he takes his column.

For over ten years, John Thoo wrote his exceptional column Through the History Glass, which explored the origins of many facets of math. Joe Conrad, the newsletter's only columnist to have written two columns, kindly has carried the torch more recently with his column In the History Corner. One of the things I greatly enjoy about Joe's pieces is that he often reveals the personality of the mathematician behind the math.

When I began my column, I wrote what I like to think were quirky columns about random topics related to teaching and what was going on in my life. As time went on, my column steered from quirky to serious, sharing various teaching beliefs and practices. More recently, I've explored the emotional side of learning and teaching.

I tend to have high idea flow, so I never thought coming up with topics would be a problem. But as I said before, I never dreamt I'd write over 55 pieces! There have been plenty of times when I've gone on bike rides the day of a newsletter deadline, wracking my brain for yet one more idea.

Another challenge has been the silence after each issue is released. My worst editing fear: no one has read the newsletter, let alone my column. But with hundreds of members, surely there must be at least one person who has read the newsletter from cover to cover. But how many more? Two people? Five? A few people have expressed thanks, but only about one person every couple years. At some point, I realized I had to stop worrying. Just write for one person and allow the possibility that there were many more.

After reaching my 20th year as editor, I'll be handing off my duties in January 2022 to Josh Rhodes, a colleague of mine at College of San Mateo, who is already contemplating a title for his column and brainstorming pieces to include. Josh has a strong intuition on how to build community and I'm excited to see what improvements he makes to the newsletter.

I'll close by saying if, by wild chance, someone has actually read all my pieces, thanks for your loyalty and I hope you'll hang in there for my two remaining ones.

CMC³ Foundation Report

Ekaterina Fuchs, Foundation President, City College of San Francisco

The CMC³ Foundation conducts fundraising events and solicits donations in order to award scholarships and prizes to qualified and deserving California Community College students who demonstrate promise and interest in the areas of mathematics and mathematics education. The CMC³ Foundation Scholarship fund sponsors the Student Poster Contest, Student Speaker Award, and California Community College Mathematics Student Scholarships. The Foundation Board offers its gratitude to our generous members whose donations make the monetary awards for these programs possible.

The Student Poster Contest is an Annual event that we all look forward to, and it was with heavy hearts that we made the decision to cancel it in 2020 due to COVID-19. We hope to be able to bring back this beloved tradition when it is safe again to do so. Our students display such passion and dedication in creating these posters, and our member faculty such commitment to their students in supporting and mentoring them.

However, we are excited to announce the Student Speaker Contest at our virtual Spring Conference! Submissions are currently being accepted online at http://www.cmc3.org/students/speaker/call_for_speakers/ . Please encourage your outstanding students to submit a proposal! The selected speaker will be featured in the conference program, and will receive a $500 scholarship, generously sponsored by Debra Landre. The deadline to submit a proposal is March 31, 2021.

(See Foundation on page 14)

The History Corner

Joe Conrad, Solano Community College

As COVID and online learning continue, I hope you and your loved ones are well. In this column I would like to discuss the development of the series expansion of the sine function. We will see that the historical development did not occur in the same sequence that we see in our textbooks. In the standard textbook development, power series representations are first done by manipulating the geometric series

$$\frac{1}{1-x} = 1 + x + x^2 + x^3 + \cdots.$$

Recognizing that this will not generate the series representations of trigonometric or exponential functions, we then learn about Taylor series. This allows us rather easily to derive the series for sine which, through differentiation, gives the series for cosine. The actual derivation of the sine series relied more heavily on algebraic techniques than we do today. Mathematicians of the seventeenth century did not shrink away from algebra that would be overwhelming to our students - and maybe even to us!

Before discussing the European development of the sine series, I should mention that Indian mathematicians of the Kerala School about two to three hundred years before Newton and Leibniz worked extensively with series. They were able to derive series that were equivalent to that of the sine and other related functions including the arctangent. From the arctangent series they found what is usually called the Gregory-Leibniz series for $\pi/4$. To develop their series, they used geometric methods that relied on attempts to rectify the circle. These investigations were driven by a desire to improve the accuracy of their calculations in astronomical studies. There is no known transmission of these ideas to European mathematicians of the seventeenth century. In fact, there is no direct evidence of the contributions of the Kerala School being known in Europe until the nineteenth century. Since their purpose was more practical, it appears that despite having many calculus-like concepts, they never proceeded to develop what we would call calculus.

For the European development of the sine series, I will focus on the work of Leibniz, but Newton independently developed the series for sine in much the same way. Leibniz began to experiment with series before he developed his calculus methods. His first triumph in this area was to determine the sum of the series of the reciprocals of the triangular numbers:

$$\sum_{n=1}^{\infty} \frac{2}{n(n+1)} = \frac{1}{1} + \frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \cdots.$$

He had been challenged by Christiaan Huygens (1629 – 1695) to find the sum. Huygens is often credited with being the first to find the sum, but it was done earlier by Pietro Mengoli (1626 – 1686) whom I mentioned in my last column as the first person after Oresme to prove the divergence of the harmonic series. Leibniz (and Mengoli) did it the same way we do it in our calculus classes, namely, by using partial fractions to rewrite the expression being

summed as a difference and then observing the result produces what we call a telescoping series. Having solved this series problem, Leibniz started his series investigations in earnest. After he had applied his new calculus ideas to the circle, he was able to find the derivative of the arcsine function. He then used Newton's binomial series which he learned from Henry Oldenburg (ca. 1615 – 1677) in 1676 to derive the series representation for the derivative:

$$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}} = (1-x^2)^{1/2} = 1+\frac{1}{2}x^2+\frac{3}{8}x^4+\frac{5}{16}x^6+\cdots.$$

Of course, we usually do binomial series as an application of Taylor series, but it predates Taylor who was not born until 1685. By the usual method known for years, Leibniz (in our terminology) antidifferentiated to get:

$$\arcsin x = x+\frac{1}{6}x^3+\frac{3}{40}x^5+\frac{5}{112}x^7+\cdots.$$

Now he used a method called series reversion which produces the series for a function if the series for the inverse function is known. The method starts by assuming the function in question, here sine, has a series representation. So, if $y = \arcsin x$, then $x = \sin y$ and we assume

$$x = \sin y = a_1y+a_2y^2+a_3y^3+a_4y^4+\cdots.$$

Since $y = \arcsin x$, Leibniz replaced each y in this series with the series he had found for $\arcsin x$:

$$x = a_1((x+\frac{1}{6}x^3+\cdots)+a_2(x+\frac{1}{6}x^3+\cdots)^2+a_3(x+\frac{1}{6}x^3+\cdots)^3+\cdots.$$

By distributing (!) and combining like terms, Leibniz saw that

$$x = a_1x+(\frac{1}{6}a_1^3+a_3)x^3+(\frac{3}{40}a_1^5+\frac{1}{2}a_1^2a_3+a_5)x^5+\cdots.$$

By equating coefficients, Leibniz concluded that

$$\begin{aligned} a_1 &= 1 \\ \frac{1}{6}a_1^3 + a_3 &= 0 \\ \frac{3}{40}a_1^5 + \frac{1}{2}a_1^2 a_3 + a_5 &= 0, \end{aligned}$$

and so on. Consequently,

$$a_1 = 1, a_3 = -\frac{1}{6}, a_5 = \frac{1}{120}, \cdots.$$

This gives us the series for sine recalling that factorial notation did not exist yet. (That had to wait until 1808.) With this in hand, it was simple for Leibniz to find the series for cosine. He clearly had no fear of extensive algebra, so it is not surprising that he used long division (really, really long division!) to find the series representations for the other trigonometric functions.

I will close by remarking that I was not familiar with the method of series reversion and both Leibniz and Newton actually used the technique to find the series expansion of e^x using the series developed by Nicolas Mercator (1620 – 1687) for $\ln(x + 1)$.

Update Your Calendar:

Spring VIRTUAL Conference
April 24, 2021

Fall VIRTUAL Conference
December 10-11, 2021

The Pleasures of Problems

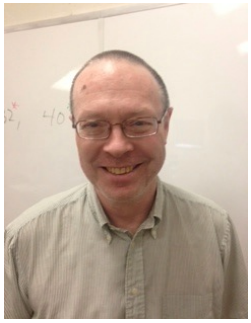
Kevin Olwell, San Joaquin Delta

Spring 2021: How many 16-digit strings of 0's and 1's are there which do not have two 0's next to each other?

Fall 2020: Let a, b, c and d be positive real numbers. Then

$$a+b+c+d \le \frac{a^2+b^2+c^2}{a+b+c} +$$

$$\frac{b^2+c^2+d^2}{b+c+d} + \frac{c^2+d^2+a^2}{c+d+a} + \frac{d^2+a^2+b^2}{d+a+b}.$$



Thanks to Fred Teti and Ruchira Majumdar for submitting a solution.

The basic idea is that the variance of any collection of data is ≥ 0. If you don't know statistics, here is the derivation we need. Let $x_1, \ldots, x_n$ be real numbers and set $\bar{x} = (x_1 + \cdots + x_n)/n$. Then

$$\begin{aligned} 0 &\le \sum (x_i - \bar{x})^2 \\ &= \sum x_i^2 - 2\bar{x}\sum x_i + \sum \bar{x}^2 \\ &= \sum x_i^2 - 2\bar{x}\cdot n\bar{x} + n\bar{x}^2 \\ n\bar{x}^2 &\le \sum x_i^2 \end{aligned}$$

After dividing by n this inequality is sometimes expressed as ``the square of the mean is less than the mean of the squares'':

$$(1) \quad \left(\frac{x_1 + \cdots + x_n}{n}\right)^2 \le \frac{x_1^2 + \cdots + x_n^2}{n}.$$

Fred Teti pointed out that this inequality also follows from Cauchy-Schwartz applied to $\mathbf{x} = (x_1, \ldots, x_n)$ and $\mathbf{y} = (1,\ldots,1)$:

$$\langle \mathbf{x}, \mathbf{y} \rangle \le \|\mathbf{x}\| \cdot \|\mathbf{y}\| .$$

Squaring both sides and dividing by n^2 recovers inequality (1).

As long as $(x_1 + \cdots + x_n) \ne 0$ we can rewrite (1) as follows:

$$\frac{x_1 + \cdots + x_n}{n} \le \frac{x_1^2 + \cdots + x_n^2}{x_1 + \cdots + x_n}.$$

In particular,

$$\frac{a+b+c}{3} \le \frac{a^2+b^2+c^2}{a+b+c}$$

$$\frac{b+c+d}{3} \le \frac{b^2+c^2+d^2}{b+c+d}$$

$$\vdots$$

and so on. Summing these four inequalities yields the result.

All are invited to submit a solution to the Spring 2021 problem via email at the address below:

kevin.olwell@icloud.com

My Journey with Late Homework

Hal Huntsman, Antelope Valley College

My journey with late work begins in my own college experience, where almost all my syllabuses stated that late work was not accepted. I usually turned in my work on time, but I felt that this policy was not completely fair. To me, if a student is learning the material, they should be able to earn at least some credit, even if the work was not on time.

So, when I started as being able to set my own classroom expectations, I allowed students to turn in late work for 50-80% credit, depending on how late it was. As a result, every semester, a few students passed my class who wouldn't have if I did not accept late work. I was pleased with my policy and the way that it gave students more chances to learn and succeed.

The pandemic caused me to rethink this policy, along with many others. Students' lives had been turned upside down, and it no longer seemed reasonable to keep the same policies. I wanted to give students as much flexibility as possible, so while I still set due dates, I allowed students to turn in homework late without penalty, as long as they contacted me about that. I accepted homework up to and including the day of the final exam.

The result of that experiment was better than I expected. Right before or shortly after every due date, some students would ask for extensions and propose new due dates. I would grant those and most of the time students completed their work by the new date. A few (about 2 per class of 35) students consistently asked for extensions and also struggled to complete their work by the new deadline. But, I did not see what I feared -- that students would just stop doing their work en masse. The large majority of students (80-90%) still turned in their work on time, and my workload was only slightly increased by allowing late work for no penalty.

More importantly, the new flexibility helped several students stay in the class and learn. I know this because I saw little drop off in my classes after the pandemic started and because students told me it made a big difference to them.

During Summer 2020, as I pondered this experience and what policies I would adopt for the fully-online Fall 2020 semester, I asked myself (and others) some questions: Why do I penalize students for late work? What is that policy teaching my students? What motivates students to do their work on time? Is there research that can help me with these questions?

Questions like these led me to a lot of places, including a 2019 book, Grading for Equity, by Joe Feldman (check out his website: https://gradingforequity.org/). Feldman's experience is mostly in the K-12 system, but much of his thinking and the policies he advocates for are easily adapted to the community college setting and beyond.

According to Feldman, most current grading practices are based in the context of early 20th century needs for factory workers and for quickly grouping people into categories. They also have their roots in phrenology, IQ tests, and other ideas that we now recognize as biased and inequitable.

He argues that a more equitable and updated grading system would be:

Accurate -- validly reflecting a student's academic performance;
Bias-resistant -- preventing biased subjectivity from infecting our grades, and using grading practices that counteract institutional and

structural biases;
Motivational -- using grading practices that support intrinsic motivation, self-regulation skills, and sense of efficacy.

Let's consider a late homework policy that either penalizes students for late work or doesn't accept late work at all through this lens.

Does this policy accurately describe a student's academic performance? If we do not accept late homework, usually that means we give the student a zero on that assignment, signifying that the student has no understanding of that content, when in fact we have no evidence from that assignment that the student does or does not understand the content. A more accurate option when a student does not turn in homework is to leave the grade blank in our grade book until the student completes the work.

If we give the student a penalty for late work, then the student's score for that assignment is based partly on whether they were on time or not, not solely on the student's understanding of the material. A more accurate policy would give the student the grade they earned on that assignment without penalty.

Is this policy bias-resistant? Well, assuming we apply the policy to all students uniformly, it appears to have no bias. But let's think about this more closely.

First, students from working-class or poor families are more likely to be required to contribute to their family's income and to have other responsibilities that may take time away from their studies. This doesn't mean that they should complete less work in the class, but it does mean that they may have more trouble meeting strict deadlines than their more privileged classmates.

Second, it's very common for teachers, even when the syllabus says "no late work," to accept late work from some students – and there are often very good reason for that. Students fall ill or have family members who are ill or there are other extenuating circumstances in which we compassionately make allowances for our students and accept late work. We make a professional judgement about when to do that and when not to. While that is often warranted and very appropriate, we need to be aware that students from middle- or upper-class families and with college-educated parents are much more likely to ask for exceptions to the rule. On the other hand, students from historically underrepresented groups are more likely to see the "no late homework rule" and be embarrassed to ask for an exception. Often, such students don't want to be seen as making excuses. Students from more privileged backgrounds are generally less hesitant to ask for exceptions.

It's clear, then, that penalizing late work is not bias-resistant. In fact, it systematically and disproportionately disadvantages poor students, students of color, and first-generation college students. A more equitable policy would explicitly allow late work for all students.

Is the policy motivational? The answer here seems, to me, to be a definite no. When a student loses points for late work, or, worse, has no opportunity to do a late assignment for credit, we are sending the message that the quality of the work is less important to us than that the work is on time. We can encourage students to do it anyway, because it will help them learn and because it will help them prepare for the next exam, but that message will be undercut by the fact that we are giving less credit, or no credit, for that work.

A policy of no late work or reduced credit for late work is clearly not equitable, according to Feldman's criteria. What's more, the purpose of homework is to encourage learning and understanding through practice

and feedback. Students should be able to practice and learn whenever they are ready, not on an arbitrary deadline. And, while we (mostly) have to live within the deadline of the academic term, does it really matter when in the term the student learns? No, the important thing is that they learned.

I continue to accept all late work, and I continue to see the benefits for my students. I don't expect that this is the endpoint of my journey, but I remain open to practices that encourage better learning and better results for my students, especially historically underrepresented students. I encourage you to consider this practice, as well. If I can support any of you in this or related efforts, please be in touch.

Questions? Comments? Want to connect? Reach Hal at: shuntsman1@avc.edu.

Foundation

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The CMC³ Foundation is pleased to announce the offering of $6000 in total scholarship funds available to qualified and deserving California Community College mathematics students. As a member of CMC³, you have the opportunity to nominate one worthy student for a CMC³ Foundation Scholarship. To be eligible for nomination, students must have completed a minimum of 30 college units, including at least 8 units at a CMC³ member college, be currently enrolled in a minimum of 6 units at a CMC³ member college, and have completed at least one mathematics course at the level of second semester engineering calculus or higher. Nomination packets must be completed and submitted by April 9, 2021. The nomination packet is available on the CMC³ Foundation website at: http://www.cmc3.org/students/scholarships/

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Calendar

Visit the CMC website (https://www.cmc-math.org/conference-overview) for current information and details about their upcoming conferences.

April 24, 2021: CMC³ 24th Annual Recreational Mathematics Conference, REMOTE. Contact: Larry Green, Lake Tahoe Community College, (530) 541-4660 ext. 341, drlarrygreen@gmail.com

August 4—7, 2021: MAA MathFest, Sacramento, CA.

September 22—25, 2021: NCTCM Annual Meeting and Exposition, Atlanta, GA.

October 28—31, 2021: 47th AMATYC Annual Conference, Phoenix, AZ. Contact: Turi Suski, suski@fvtc.edu

December 10—11, 2021: CMC³ 49th Annual Fall Conference, REMOTE. Contact James Sullivan, Sierra College, (916) 660-7973, jsullivan@sierracollege.edu

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