

Vision - Potential

Vision Within Every Instructor - Potential Within Every Student

Newsletter of the HBCU College Algebra Reform Consortium*
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[1] Time to *Refocus* Intermediate Algebra

We need to invest in education ... the number of schools rated "Failing" is sky rocketing ... (college) remedial programs in reading, writing, and math has become a growth industry ... large percentage of high school graduates are not prepared for college work ... City University of New York (CUNY) spent \$33 million last year on remediation ... the United States has declined from first place to eleventh among developed countries in terms of the percentage of colleges graduates in its population ... the list of doomsday statements goes on and on. From the President to the Halls of Congress to State Houses to local School Boards, educational policy (or lack of) is high on the priority list of concerns.

While the numbers of high school students

* Supported by the U.S. Military Academy.

who are well prepared for college work continues to rise, so do the numbers of students who begin their college experience taking developmental courses. *The New York Times* recently (March 4, 2011) published an article on developmental education at community colleges. Speaking of CUNY's six community colleges, the article stated that "About three-quarters of the 17,900 freshmen at the community colleges this year needed remedial instruction in reading, writing, or math." Nationwide "The knowledge gap at community colleges is increasingly being recognized as a national problem. About 65 percent of all community college students nationwide need some form of remedial education with students shortcomings in math outnumbering those in reading by 2 to 1."

How well are we doing at the college level to remediate the thousands of our students that enter our Intermediate Algebra development program? The answer, unfortunately, is not very well. "Nationwide, as at CUNY, fewer than half of the students directed to take one or more remedial classes ('developmental education') complete them." Dr. Bailey, Director of the Community College Research Center at Teachers College at Columbia University said: "Many, many community college presidents will say that math developmental education is the most difficult problem they're facing."

We at the college level, whether teaching developmental programs or not, need to initiate

or join the debate on refocusing Intermediate Algebra. In particular, we need to consider the efficacy of our present programs by asking and answering questions such as the following:

- * What is the policy for selecting students to enter developmental courses?
- * What are the goals of our developmental program? (What does it mean to prepare a student for College Algebra?)
- * How is mathematical reasoning developed?
- * How are reading, writing, and presentation skills incorporated, if at all?
- * How much emphasis is placed on students learning to translate a written description of a problem into a mathematical model?
- * What is the primary pedagogical approach? (teacher centered or student centered?)
- * What is the principal instructional method (e.g., lecture, small group)?
- * How heavy is the emphasis on skill and drill? How effective is it?
- * What types of testing are employed (e.g., multiple choice, fill-in the blanks)?
- * Does class size matter?
- * What college career paths do students follow who pass the developmental program?
- * Is the course content suitable?
- * How important is it to create positive attitudes in the students? How is this accomplished?

The ensuing debate over the answers to these questions will lay the groundwork for refocusing Intermediate Algebra, as it did for College Algebra twelve years ago. The philosophy to “educate students for the future rather than train them for the past” is as applicable to Intermediate Algebra as it is to College Algebra.

(Everyone is encouraged to join in the debate on Intermediate Algebra and to submit articles on it to the *Vision-Potential* Newsletter.)

[2] Online Discussion of Questions/Postings

Don Haussler

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This is a continuation of Don Haussler’s article “The Marriage of Writing and College Algebra” that appeared in the February 2011 issue of this Newsletter. These Postings are writing assignments that Don has given his students.

Posting #1: At this point in your academic career, you have had experiences (good and bad) with mathematics and mathematics instructors. Select either one of the good or one of the bad experiences and “talk” about it.

Posting #2: Pick 2 “strategies” that you use when you study material in your favorite class. How could you use these strategies to be more successful as a mathematics student? If you do not feel either of them would work in a mathematics class, select 2 other strategies you would try.

Posting #3: You have just come from math class. The instructor has talked about a topic that is totally new to you. What are your feelings at this time? How will you work with this new concept between now and the next class session to gain a better grasp of it?

Posting #4: You have just taken a look at your course outline in algebra class and notice that a unit test is scheduled for 2 weeks from today. What will be your plan in preparing for the test? Also, select 1 thing that you have never tried to do in getting ready for a test and tell how you will work with it in preparing for this test.

Posting #5: Technology (computer, graphing calculator, software packages, etc.) has become a part of many math classes the past few years. Knowing that, what is your comfort level in making use of it? For you, personally, what is the greatest challenge you will face in working with this new technology?

Posting #6: Bill, Jane and you have just formed a study group to work on your math class. Of the 3, you are the “expert.” It seems to you that Bill and Jane do not contribute much to the group –i.e. you do all the work and they benefit. How do you feel about this? How will you handle this situation ?

Posting #7: Midterm of this semester is quickly approaching. Evaluate your performance in this particular math class. Include both the positive and negative things about YOU so far. Then, discuss how you will maintain the positive things about this semester and how you will try to change the negative items.

[3] Query

Are there four consecutive integers such that the sum of the first two times the sum of the last two is a power of two (i.e., 2^x)? First determine if the smallest of the integers is even or odd and then either give an example answering the Query in the affirmative or show that no solution is possible.

[4] Basketball’s 3-Point Shot

The 3-point shot was first adopted by the National Basketball Association in the 1979-80 season. For the first five years, the number of 3-point attempts per game averaged 2.8 per game. However this changed starting with the 1984-85 season when both the number of attempts per game (3Pt Att/g) and the percentage of successful attempts (3Pt%) began

to increase as shown in the following Table. (Source: Basketball-Reference.com.)

Season	3Pt Att/g	3Pt%
1984-85	3.1	.282
1985-86	3.3	.282
1986-87	4.7	.301
1987-88	5.0	.316
1988-89	6.6	.323
1989-90	6.6	.331
1990-91	7.1	.320
1991-92	7.6	.331
1992-93	9.0	.336
1993-94	9.9	.333

- Plot the 3-point attempts (3Pt%) starting with the 1985-86 season. Number the seasons, letting 1 denote the 1985-86 season, 2 the 1986-87 season, 3 the 1987-88 season, etc. Develop a reasonable model and use it to predict the number of 3-point attempts in the 2007-8 season.
- Plot the percentage of successful 3-point attempts (3Pt%) starting with the 1985-86 season. Number the seasons, letting 1 denote the 1985-86 season, 2 the 1986-87 season, 3 the 1987-88 season, etc.
- What is the general shape of the scatter plot (power, exponential, logarithmic)?
- Which of the two functions:

$$y = 0.2765 x^{0.08597},$$

$$y = 0.0227 \log(x) + 0.2849$$
 gives a better fit to your scatter plot and provides a more accurate prediction to the 32.6% success rate in the 2007-8 season? Explain your reasoning.

[5] Unemployment by Education Levels

“The Labor Picture for February” (2011) underscores the importance of having a college

degree when entering the job market as reported in *The New York Time* in the following table.

Unemployment by Education Level	February
Less than high school	13.9%
High school	9.5%
Some college	7.8%
Bachelor's or higher	4.3%

[6] Eight Good Behaviors

Google recently published (*The New York Times*, March 13, 2011) the results of its study on “Making a Better Boss,” an effort to improve management. The results contain the following list of Eight Good Behaviors. Could these behaviors be modified (e.g., replace the word “employees” by “students,” “team” by “class”) to Make a Better Teacher?

1. Be a good coach
 - * Provide specific, constructive feedback, balancing the negative and positive.
 - * Have regular one-on-ones, presenting solutions to problems tailored to your employees' specific strengths.
2. Empower your team and don't micromanage
 - * Balance giving freedom to your employees, while still being available for advice. Make “stretch” assignments to help the team tackle big problems.
3. Express interest in team members' success and personal well-being.
 - * Get to know your employees as people, with lives outside of work.
4. Don't be a sissy: Be productive and results oriented
 - * Focus on what employees want the team to achieve and how they can help achieve it.
 - * Help the team prioritize work and use seniority to remove roadblocks.
5. Be a good communicator and listen to your

team

- * Communication is two-way: you both listen and share information.
 - * Hold all-hands meetings and be straightforward about the messages and goals of the team. Help the team connect the dots.
 - * Encourage open dialogue and listen to the issues and concerns of your employees.
6. Help your employees with career development
 7. Have a clear vision and strategy for the team
 - * Even in the midst of turmoil, keep the team focused on goals and strategy.
 - * Involve the team in setting and evolving the team's vision and making progress toward it.
 8. Have the key technical skills so you can help advise the team
 - * Roll up your sleeves and conduct work side by side with the team when needed.
 - * Understand the specific challenges of the work.

[7] Notices

1. Jennifer Beecher is the McGraw-Hill Representative for Contemporary College Algebra 563.584.6323, [jennifer_beecher@mcgraw-hill.com]
2. Deadline for contributions to the April Newsletter is April 1, 2011. Opinion articles, suggestions for writing assignments, small group in-class activities, small group out-of-class projects, Queries, announcements, etc. are welcomed.

3. To subscribe to this Newsletter, write to Don Small, Department of Mathematics, U.S. Military Academy, West

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