

Final Sabbatical Report :

Ben Rode    October 10, 2012

The Research and Practice of Teaching Math to Adults with Learning Differences with the Goal of Improving Instruction in the Two Semester Intermediate Algebra Course at Moorpark College

I will begin my report with an excerpt from    my original proposal for sabbatical leave. This

# The Research and Practice of Teaching Math to Adults with Learning Differences with the Goal of Improving Instruction in the Two Semester Intermediate Algebra Course at Moorpark College

## Phase 1: The Research

I began my investigation of the current research available on Teaching Math to Adults with Learning Disabilities by visiting the Education Research Collection at the CSUN Library. I was also able to access several Education Research databases online.

I discovered

seemed obvious to me. For example, g

## Conclusion

During my sabbatical, I kept coming back to research new topics as they arose in my investigations. I didn't begin with research, finish it and move on to visiting and action plans. In fact, the research part of my sabbatical has never really ended. New contacts led to new information, new information led to new research, which led to new information, which led to new contacts and new research, and so on. Even as I write the "final" report, I am continuing to find new information through research.

I have compiled a thick binder with notes, printed copies of research articles and other materials from my visiting that will continue to be a resource for me to use in my continuing efforts to improve the math success of students with learning differences. I am happy to share this resource with others who are interested in the same goals.

Phase 2: Visiting

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## Visit with Brooke Choo, Irvine Valley College

I spoke with Brooke Choo at Irvine Valley College on 3/20/12. Brooke is with the DSP&S Department, and is the Region 8 representative for Learning Disabilities for the State Chancellor's Office. Brooke spent over an hour discussing various issues relating to teaching math to students with Learning Disabilities with me.

The primary reason I got in touch with Brooke was to find out what IVC was doing to help LD students in math. They offer a Special Services class in Basic Math. The class is taught by DSP&S staff, but funded through the Math Department. That is the only class that is modified to help L D students in math.

LD students get 2 hours per week in the Success Center which provides 1 on 1 tutoring in Pre-Algebra and Beginning Algebra. ( Non LD students can get 1 hour a week.) This is grant funded. There is Math Center that offers drop -in tutor ing for all math classes using student tutors.

Brooke was interested in what MC is doing to help LD students in math, and I went through that in detail. She had very positive comments about our efforts in math.

Brooke had mentioned Statway when she responded to my email, and we talked about that for some time. This is a national project funded through the Carnegie Foundation that is piloting a one year Pre-Statistics/Statistics course. It is very similar to the course being piloted by CAP at Los Medanos Community College . The issue of articulation came up, and Brooke thinks CSU is "on board" with articulating the STAT way program. She gave me some names of people I can contact to find out more about Statway and the articulation issue.

Another topic we discussed was the "universal design for learning" (UDL) approach to teaching math. I have encountered this repeatedly, and I need to do more research into how universal design impacte3ticeam..(nt)1n.c 0 Tw 17.4 0 Td8.9

Their approach is different. They have three courses offered through the Guidance Department that are meant to be taken along with the appropriate math class. The first course is arithmetic, and can be taken alone. The next course covers pre-algebra topics, and is taken along with Pre-Algebra. The last course covers algebra skills and is taken with Beginning Algebra. They stated that they did not always find the math Department sympathetic to the needs of students with learning disabilities.

They told me that approximately 20% of De Anza students place in PreAlgebra based on the Acu-Placer test given at De Anza, and the math department offers many "brick-and-mortar" Pre-Algebra classes. The Math Department also began offering modules that enable students to place into Intermediate Algebra by passing all the module tests or by doing some modules and simply retaking the placement exam.

They have a program, MPS, which is Math Performance for Success. Basically, students go through as a cohort from Pre-Algebra to Statistics. There is an application form for the program, and you have to be accepted to be allowed to enroll. Counselors participate with the cohorts, and in fact, this program is run through the counseling department.

De Anza is cutting back the disabled sttsm(i4(s)1)7(i)>BDC6(e)-oc5uo(e M4 Tcs)11(s)3( cdc -0.004 Tw 2.967



Overall, the visits were extremely helpful because I found out so much unexpected information talking to other educators . Many new lines of inquiry were opened through these discussions, and my understanding was expanded enormously. Based upon my actual visits, phone calls, and virtual visits , Moorpark College is doing more than most other Community Colleges in California with math and students with learning disabilities. All such programs are experiencing budget cuts, and it is important t hat math departments gain a better understanding of how to teach mixed classes with many levels of math "differences" present. I think UDL has the best roadmap for how to deal with these all levels of math "differences" in our classes.



I intend to continue to make presentations related to my sabbatical topic, and I am scheduled to make another presentation on Statway to the math department in February. This might lead to the department experimenting with the Statway curriculum as a way to improve the rate of success for non-STEM students passing their math transfer requirement.

## Phase 4: Action Plans

### Fall 2012

I have decided to wait to post the "Teacher's Guide for Math 3A and 3B" until I have tried the new ideas that I intend to include in my recommendations. I would prefer to speak with the authority that using the activities I am promoting will provide. It is also quite likely that I will change and adapt these ideas once I have tried them in my classes, thus improving the usefulness of the "Guide". My action plan for the fall is to incorporate as many new ideas as I







Here are 3 word problems from a Math 1 final exam.  
Solve each, showing the equation and all your work.

After you have solved the problems, write 3 word problems  
of your own following the directions below.

- 1) If a number is added to 2 more than 3 times itself, the result is 38. Find the number.  
Show your equation for full credit.
  
- 2) Gates has 51 coins in his pocket. The coins are dimes and quarters worth \$ 9.60 . How many of each coin does Bill have? Show your equation for full credit.
  
- 3) The length of a rectangle is three more than twice the width. If the perimeter is 72 inches, find the dimensions of the rectangle. Show the equation for full credit.

Problem #1) Write a word problem that requires an equation to solve and has the answer 13. Show the solution including the equation and all the work.

Problem #2) Write a word problem that requires an equation to solve and involve nickels and dimes. Show the solution including the equation and all the work.

Problem #3) Write a word problem that requires an equation to solve and has Bonnie and Clyde in the problem. Show the solution including the equation and all the work.

MATH 3A

MINI-PROJECT #2

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NAME

You can work together, but each person must turn in their own project.

1) Solve the system. Show ALL your work on separate paper in a clear, organized manner.

(30pts)

$$3x - 2y + z = -4$$

$$x + 3y - 2z = 13$$

$$4x + y + 3z = -3$$

2) Gates has 25 coins which are nickels, dimes and quarters worth \$3.65. The number of dimes is one more than the number of nickels. Set up a system of 3 equations and solve to find how many of each coin Gates has. Show ALL your work on separate paper in a clear, organized manner. (20pts)



permission to type them. Your cookbook will be graded periodically for clarity and completeness. You will be able to use the cookbook on the final exam if it is complete and clear.

Title: Solving a linear equation

Ingredients: An equation with one variable and no exponents like:

$$3(2 - x) + 4 = 7x - 2$$

Instructions: 1) Simplify

a) Eliminate brackets using the distributive property

b) Combine like terms

c) Variable to one side

2) Solve

a) Add the opposite

b) Divide by the coefficient (or multiply by the reciprocal)

3) Check by substituting into the original equation

Example:

$$3(2 - x) + 4 = 7x - 2$$

$$6 - 3x + 4 = 7x - 2$$

$$10 - 3x = 7x - 2$$

$$\begin{array}{r} 10 - 3x = 7x - 2 \\ +3x \quad +3x \\ \hline 10 = 10x - 2 \end{array}$$

$$10 = 10x - 2$$

$$\begin{array}{r} 10 = 10x - 2 \\ +2 \quad \quad +2 \\ \hline 12 = 10x \end{array}$$

$$\frac{12}{10} = \frac{10x}{10}$$

$$10 \quad 10$$

$$12 = x$$

1a) Eliminate brackets

1b) Combine like terms

1c) Variable to one side

2a) Add the opposite

2b) Divide by the coefficient

opposite of the non-variable term. If there are denominators in the equation, you can clear the denominators