

DO THE MATH!

INCREASING STUDENT ENGAGEMENT THROUGH COURSE REDESIGN

Cleveland State Community College



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Dr. Paula Myrick Short, Principal Investigator
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Houston, We Have A Problem

- **The Problem – Developmental Math**

- High failure rates
- Low attendance
- Good students stuck for 1 – 2 semesters
- Roadblock to student success

- **The Solution – Course Redesign**

- Try something new
- Completely different approach
- Utilize online learning systems
- Remove roadblock to success

- **TBR Involved In System-Wide Redesign**



NCAT's Twin Towers

- **Improve learning by changing the process**
 - Use technology
 - Strengthen weaknesses
 - Work as a team
- **Reduce costs at the same time**
 - Improve efficiency
 - Increase flexibility
- **The NCAT Motto**
 - You can improve learning while reducing costs!
 - NCAT has shown these goals are not contradictory



Why Stop There?

- **3 Developmental Math Courses**
 - Basic Math, Elementary Algebra, Intermediate Algebra
- **6 College Level Math Courses**
 - College Algebra, Statistics, Finite Math
 - Precalculus I, Precalculus II, Applied Calculus
- **2 Computer Labs, 4 Computer Classrooms**
 - 65 computer lab on main campus in Cleveland
 - 35 computer classroom/lab on campus in Athens
- **Project Timeline**
 - Spring 2008: Elementary Algebra and Intermediate Algebra
 - Fall 2008: Basic Math, College Algebra, Statistics, Finite Math
 - Fall 2009: Precalculus I, Precalculus II, and Applied Calculus
- **1200+ Students Enrolled In 9 courses Each Semester**

The NCAT Playbook

- **Low Stakes Testing**
 - Reduces anxiety so students can learn
- **Points For Everything**
 - It will improve attendance and homework
- **Freshmen Don't Do Optional**
 - No surprise here, so make everything mandatory
- **Structured Flexibility**
 - Give students choices within a solid framework
- **Beyond No Significant Difference**
 - Using technology by itself doesn't make a difference

The Five Principles of NCAT

- **Redesign the whole course**
 - Don't just redesign a few sections
- **Increase student engagement**
 - Students learn by doing
- **Provide individual assistance**
 - All students need help – some more than others
- **Ongoing assessment**
 - Continuous assessment keeps students engaged
- **Prompt feedback**
 - Technology can provide this

Our Little Twists*



- **Course Layout**

- Each course consists of 10 – 12 mini-modules*
- 1 hour class meeting each week – students work in class*
- 2 hours work outside class each week – at least 1 hour in lab
- Students expected to complete one module each week*

- **Course Grade**

- 10% Attendance Grade - class & lab attendance, module finished
- 30% Homework Sets – 2 to 5 sections per module
- 60% Quiz and Exam Grades – 1 quiz each module, 2 exams

- **Course Standards**

- Students must complete every homework set (70 or better)
- Students must pass every module quiz and exam (70 or better)
- Students must pass attendance grade (70 or better)
- Students may take each quiz and exam multiple times

- ***Our Little Twists On NCAT Recommendations**

How Cleveland State uses MyMathLab...

- Students are given a “to do” list
 - Videos, homework and quizzes



Elementary Algebra

Tools: Course Admin | Drop

► Course Calendar

[Legend](#)

Course Author

Course Home

Syllabus

Do Homework

Take a Test

Gradebook

MML Instructor Tools*

eBook

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Homework and Tests

Show All Homework Quizzes & Tests Chapters

Assignments 1 - 38 of 38 ► [View 20 per page](#)

Due	Assignment	Time Limit	Attempts	Gradebook Score
	Orientation			
	Module 1 Section 1.1			see score
	Module 1 Section 1.2			
	Module 1 Section 1.4			
	Module 1 Quiz		0 of 10	
	Module 2 Section 1.5			
	Module 2 Section 1.6			
	Module 2 Section 1.7			
	Module 2 Section 1.8			
	Module 2 Quiz		0 of 10	
	Module 3 Section 2.1			
	Module 3 Section 2.2			
	Module 3 Quiz		0 of ∞	
	Module 4 Section 2.3			
	Module 4 Section 2.6			
	Module 4 Quiz		0 of 10	

How Cleveland State uses MyMathLab...

- Students can receive help when they need it

Cleveland State
COMMUNITY COLLEGE

Course Author

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⌕

MyMathLab

Homework: Module 2 Section 1.6

<< < 1 2 3 4 5 6 7 8 9 10 > >>

Question 1.6.75

Exercise Score: 0 of 1 pt


Assignment Score: 0% (0 of 20 pts)

0 of 20 complete


Subtract the following.

$$-6 - (-3) = \square$$

$$-6 - (-3)$$

 Help Me Solve This

 View an Example

 Textbook

 Animation

 Print

Enter any number or expression in the edit field, then click Check Answer.

All parts showing

Clear All

Check Answer

Save

How Cleveland State uses MyMathLab...

- View an example

The screenshot shows a software window titled "View an Example". The window is divided into two main sections. The left section contains the text "Subtract." followed by the expression $-5 - (-8)$. The right section contains a series of instructions and calculations: "This exercise asks you to subtract one number from another. To do this, start by rewriting the exercise as an addition problem." followed by the equation $-5 - (-8) = -5 + (8)$; "Now add these two numbers." followed by the equation $-5 + (8) = 3$; and "Finally, check your answer by addition." followed by the equations $3 + (-8) = -5$ and $-5 = -5$. At the bottom of the window, there is a status bar that says "Question is complete." with a question mark icon on the right. Below the status bar, on the left, it says "All parts showing" next to a progress bar. On the right, there is a yellow "Close" button.

View an Example

Subtract.

$-5 - (-8)$

This exercise asks you to subtract one number from another. To do this, start by rewriting the exercise as an addition problem.

$-5 - (-8) = -5 + (8)$

Now add these two numbers.

$-5 + (8) = 3$

Finally, check your answer by addition.

$3 + (-8) = -5$

$-5 = -5$

Question is complete.

All parts showing

Close

How Cleveland State uses MyMathLab...

- Students can do an assignment multiple times

MyMathLab

Homework: Module 2 Section 1.6

Navigation: << < 1 2 3 4 5 6 7 8 9 10 > >>

Question 1.6.75

Exercise Score: 1 of 1 pt Assignment Score: 5% (1 of 20 pts) 1 of 20 complete

Subtract the following.

$-8 - (-4)$

$-8 - (-4) = -4$

Help Me Solve This
View an Example
Textbook
Animation
Print

Question is complete.

All parts showing

Similar Exercise Save

How Cleveland State uses MyMathLab...

- Students have immediate access to their grades

MyMathLab

Settings

Home Page Manager

HW & Test Manager

Study Plan Manager




Gradebook

► [MyMathLab Calendar](#)












Results

Overall Score: **93.7%** (937.4/1000 pts)

► [Show details](#)

 Past 2 Weeks  Past month  Entire course to date All Assignments ▼ Study Plan Results

Results from entire course to date.

Results from entire course to date.		Correct/ Total	Score	Time Spent	Date Worked
 Module 9 Section 8.2	Review	10/15	66.7%	44m	07/19/10 1:31pm
 Module 9 Section 8.1	Review	15/15	100%	59m	07/19/10 12:45pm
 Module 8 Quiz	Review	8.5/10	85%	5m	07/13/10 5:52pm
 Module 8 Quiz	Review	5.5/10	55%	8m	07/13/10 5:39pm
 Module 8 Section 7.5	Review	20/20	100%	52m	07/13/10 5:27pm
 Module 8 Section 7.4	Review	20/20	100%	26m	07/08/10 5:41pm
 Module 7 Quiz	Review	9.1/10	91%	6m	07/01/10 7:13pm
 Module 7 Section 7.3	Review	15/15	100%	39m	07/01/10 7:03pm
 Module 7 Section 7.2	Review	15/15	100%	23m	07/01/10 5:54pm
 Module 7 Section 7.1	Review	20/20	100%	34m	06/28/10 1:09pm
 Module 6 Quiz	Review	10/10	100%	3m	06/28/10 12:00pm

Teaching Old Dogs New Tricks

Traditional Faculty Role

Focus

- Covering material
- Preparing lectures
- Grading papers

Role

- Dispenser of information

New Faculty Role

Focus

- Student progress
- Student success
- Helping students

Role

- Mentor, coach, guide



Attitude Adjustments

Before Redesign

Students

- I want my lecture!
- Study night before exam
- What do I need to pass?

Teachers

- I want my lecture!

Class

- Low attendance
- Don't do homework
- Not engaged in class

After Redesign

Students

- I like this!
- Weekly homework, quiz
- I want an A.

Teachers

- This works!

Class

- Median attendance grade 88
- Average homework grade 97
- Come to class early, stay late



But Did It Help?



- **Developmental Math**

- Success rate in developmental math courses went from 54% to 72%
- Intermediate Algebra had a 79% success rate in Fall 2008

- **College Level Math**

- Success rate in three redesigned courses increased from 72% to 75%
- College Algebra improved, Finite Math & Statistics stayed same
- 33% increase in students passing a college level math course '08-09
- More students passed a college level math course in Spring 2009 than were enrolled in a college level math course in Spring 2008

But Did It Help?

- **Developmental Students In College Level Math**
 - Before redesign 71% success for developmental students in math
 - After redesign 76% success rate for developmental students in math
 - Fall 2008 developmental students 79% success rate in math while college math success rate was unchanged at 72%
- **Overall Findings***
 - Redesign had a strong positive impact on course success
 - Redesign had a strong positive impact on success in next course, regardless of whether it was developmental math or college math
 - Gender and race were not determining factors in course success under the redesign

**Based upon a study by the TBR , March 2010 - (logistical regression, 3 semesters before/after redesign, looking at success rates in Developmental Math courses and Freshman Math courses, among 18-19 year olds).*

New Solutions to Old Problems

- **Continuous Enrollment Plan**

- Students may start in any redesigned math course when they finish the course they are currently enrolled in, without switching classes
- Students add second class to schedule if they complete it
- 46 students completed multiple math courses in Fall 2008
- 33 of these exited developmental math in one semester
- 1 student completed 4 courses in one semester (Fall 2009)

- **Back to the One Room Schoolhouse**

- Low enrollment classes always a problem
- Solution: Two classes in same room at the same time
- New course offerings at all campuses in Fall 2009
- Scheduling flexibility increase due to this strategy
- Creates an atmosphere of Math on Demand

Final Thoughts

- **Redesign (not redesign)**
 - Tweaking lectures will give you tweaked results
 - Significant change can give you significantly different results
- **Learning by Failing**
 - Student s learn by doing , failing, and getting help
 - The Teachable Moment
- **Goal: Transformation**
 - Lakeisha before redesign
 - Lakeisha after redesign

Questions?

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