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Lessons Learned Using Publisher's Web-based Software for Assessment

TIME
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Community College Information

In the USA, the community college system is a college in a person's hometown area. Community colleges are:

- Open Admissions: only requirement is a High School Diploma
- First 2 years of a 4-year Bachelor Degree, then students transfer to University.
- 2/3 of all students take courses that re-teach high school mathematics, since so many are underprepared.

Comm. College Info (cont'd)

- Half student body is over 25 years old
- Many students have full time employment and families.
- Algebra is a degree requirement

Completion Rates in Fall 2006

Of the students who registered for the following math courses, the percent represents those who successfully completed the course and could move on to the next course.

- Pre-Algebra (arithmetic-remedial): 44%
- Beginning Algebra (linear functions and factoring – remedial): 41%
- Pre-Calculus and Calculus(college level):54%

Some difficulties in passing the math classes:

- Many students have difficulty reading and understanding math from textbook
- Textbooks are expensive ($150-$200)
- Student attendance is poor
- Many students do not do homework

There is more than one way to teach and learn

A tool: Publishers' Software

Comprehensive content delivery, assessment and course management system – text specific – containing:

- Electronic interactive textbook
- Video and Power Point Lectures
- Animations and applets
- Connects students to live tutors via chat

Useful for both onground and online math classes

Publishers' Software (cont'd)

- Heavy marketing campaigns by textbook publishing companies
- Free to instructors
- Free to students who purchase a traditional text (texts cost $150-$200)
- Students pay $35-$100 to purchase software licenses alone, some of which include an electronic copy of the text- saving students $100 or more.

Publishers' Software (cont'd)

- Students enter homework solutions online, automated hints available, homework is graded immediately
- Delivers and grades quizzes/tests
- Facilitates student-teacher email
- Provides formative assessment: with click of a button, teacher knows what class cannot do, and adjust lesson for day

Textbook publishers' software

Two products that I have used :

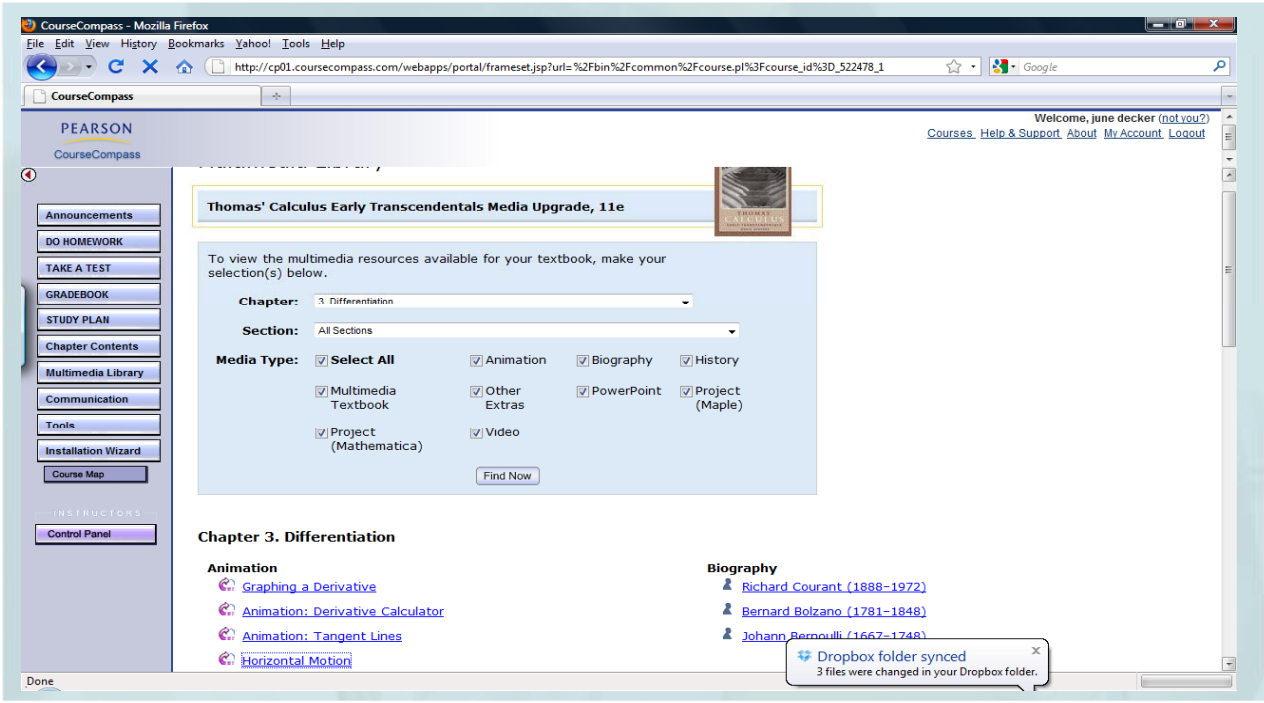
1) Web Assign accompanies the texts from a variety of publishers including Cengage (BrooksCole).

www.webassign.com

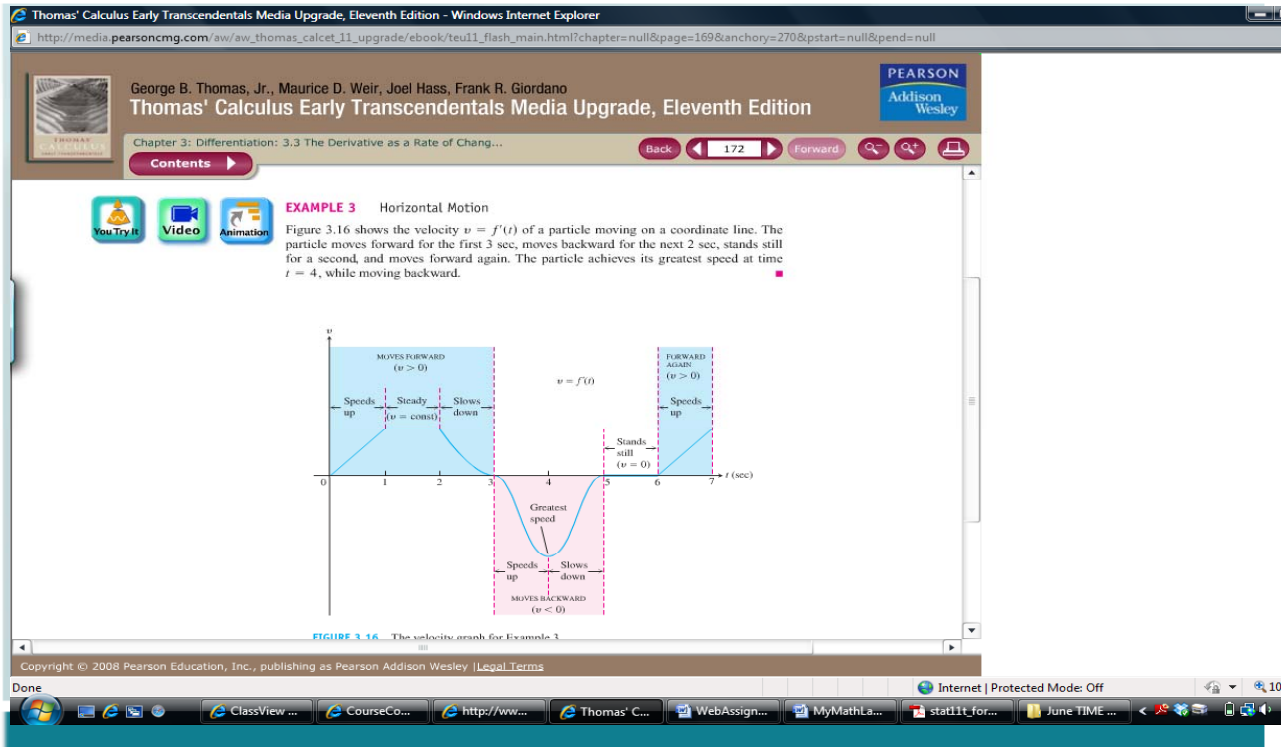
2) MyMathLab developed by Pearson Publishing Co. www.mymathlab.com

MyMathLab –Thomas Calculus

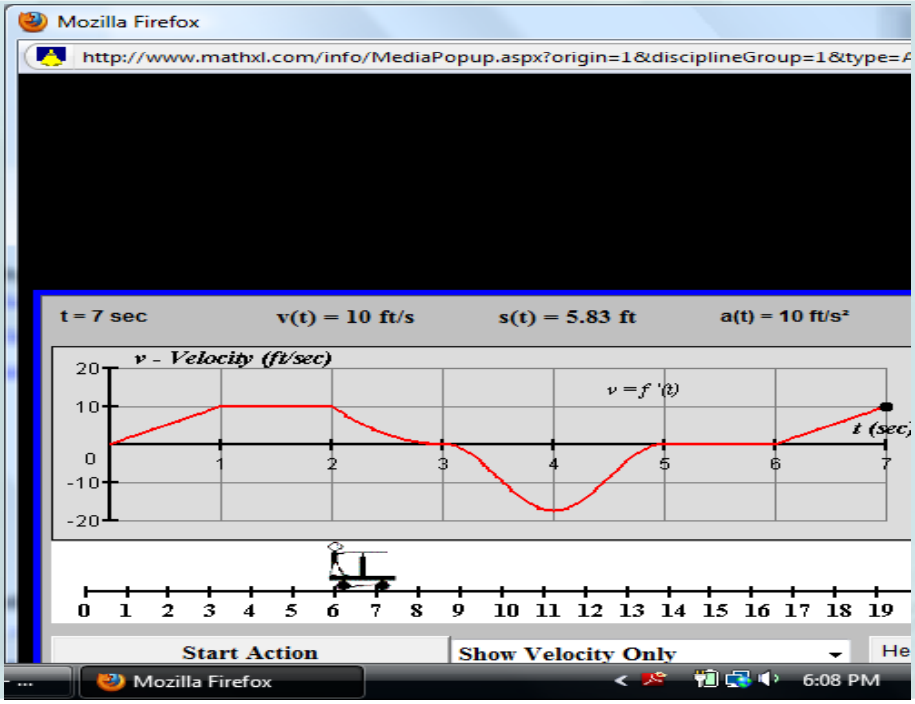
(what a screen looks like)



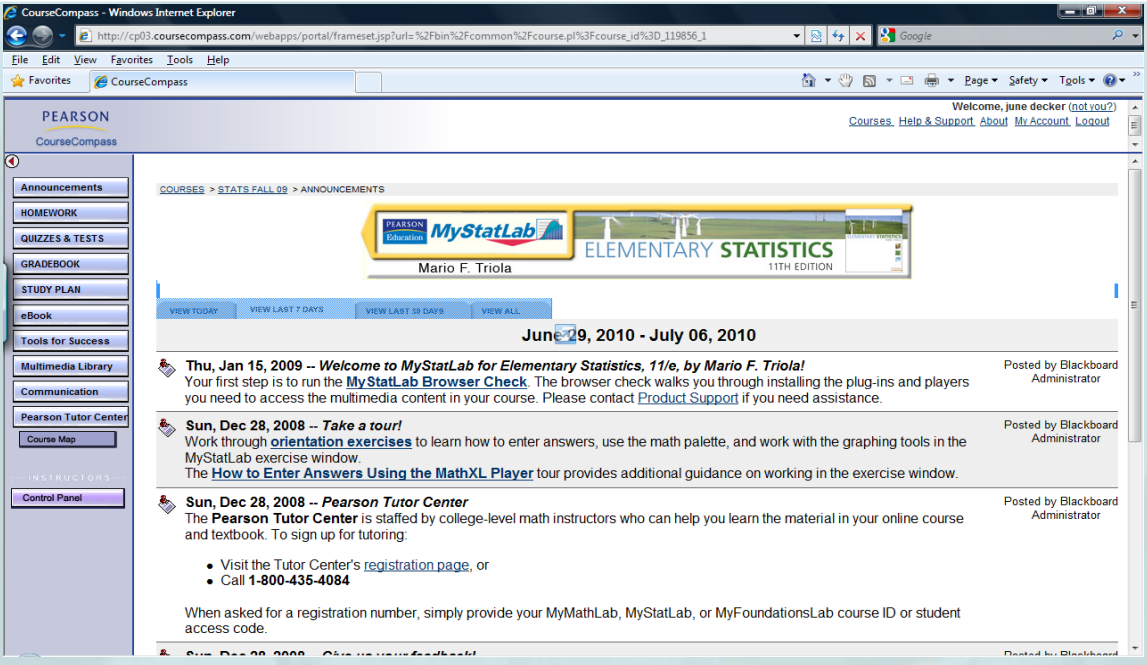
MyMathLab –Thomas Calculus



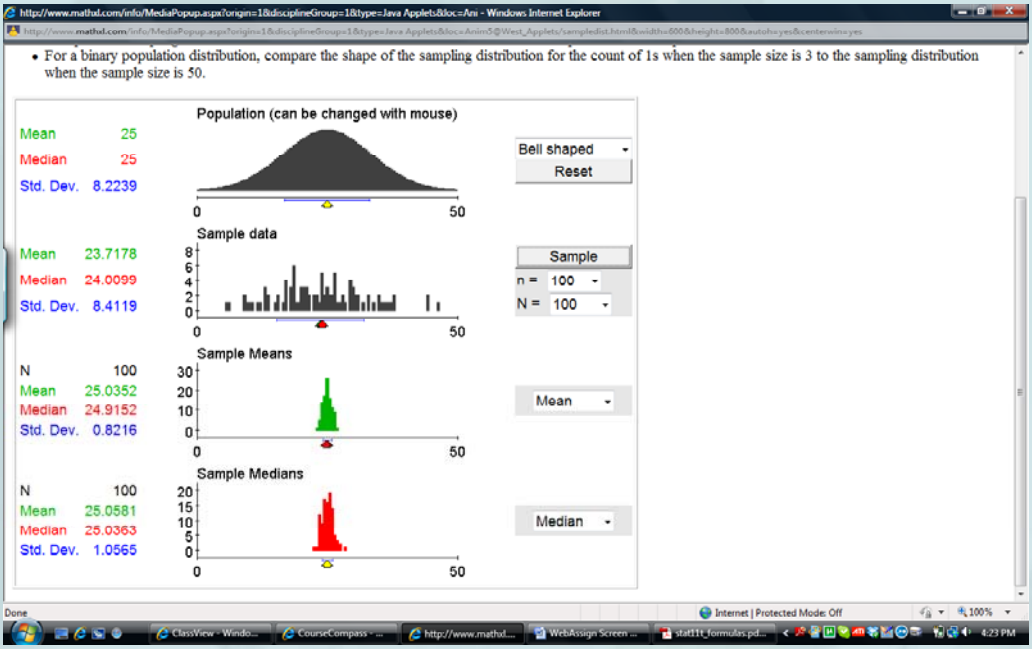
Horizontal Motion Applet in MyMathlab



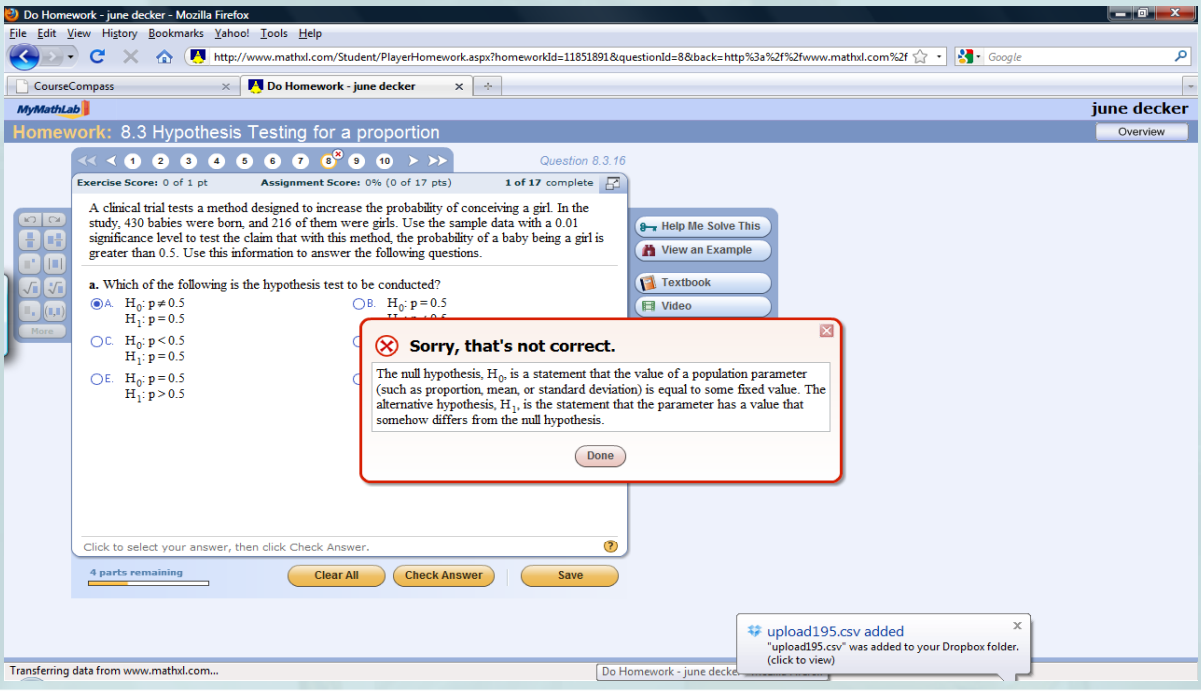
MyMathLab –Statistics Text



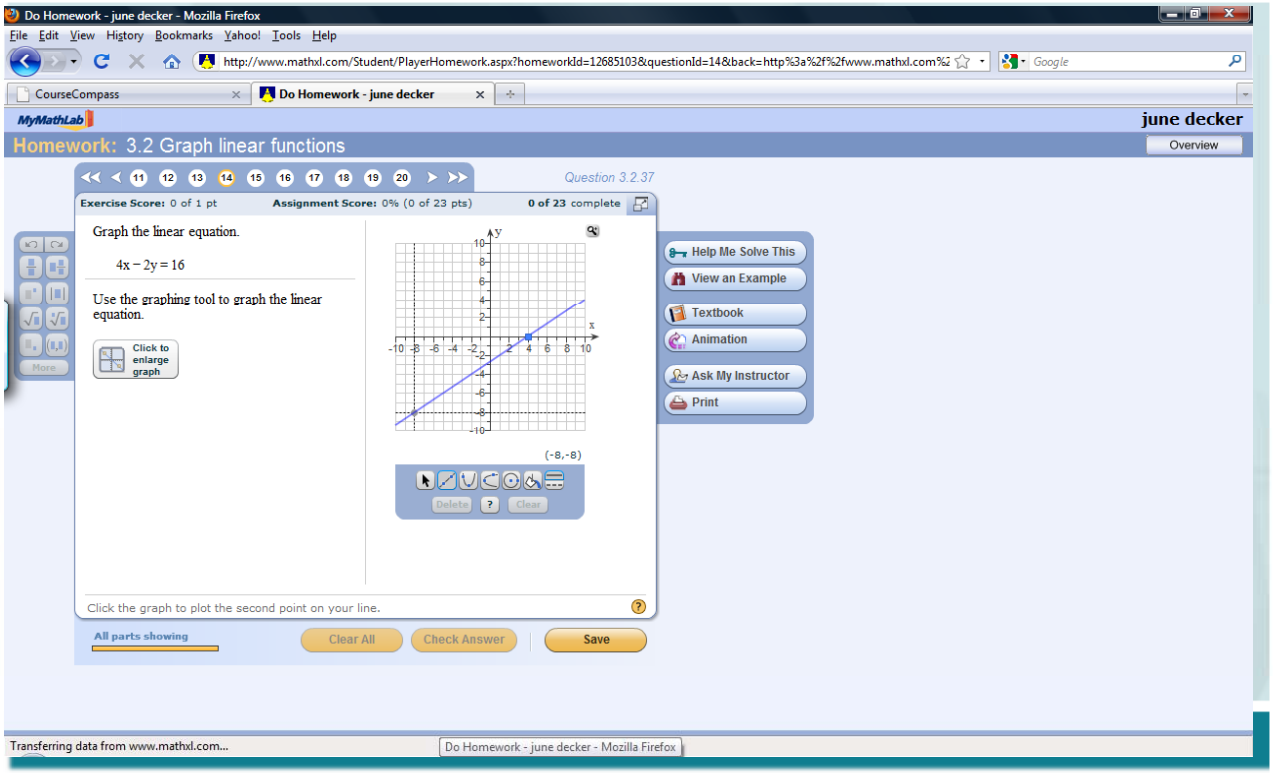
Applet for Central Limit Thm



MyMathLab Statistics HW



MyMathLab free response question for graphing



MyMathLab Grade Reporting

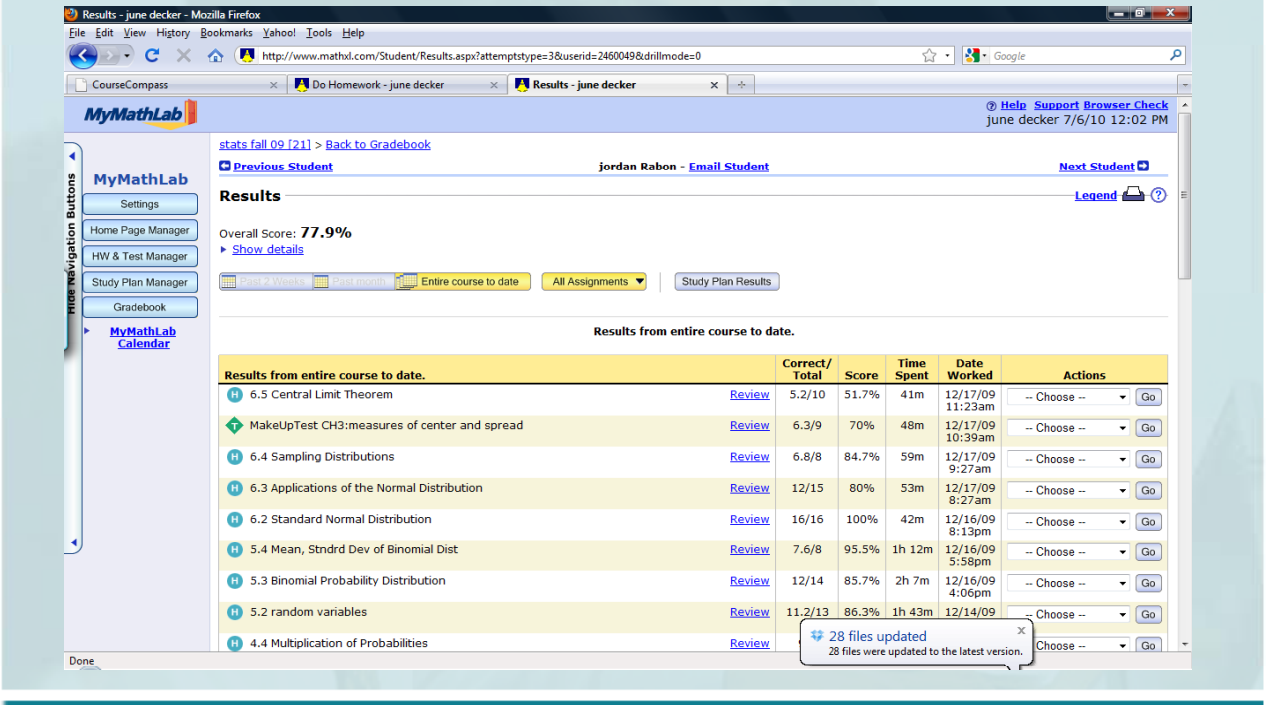
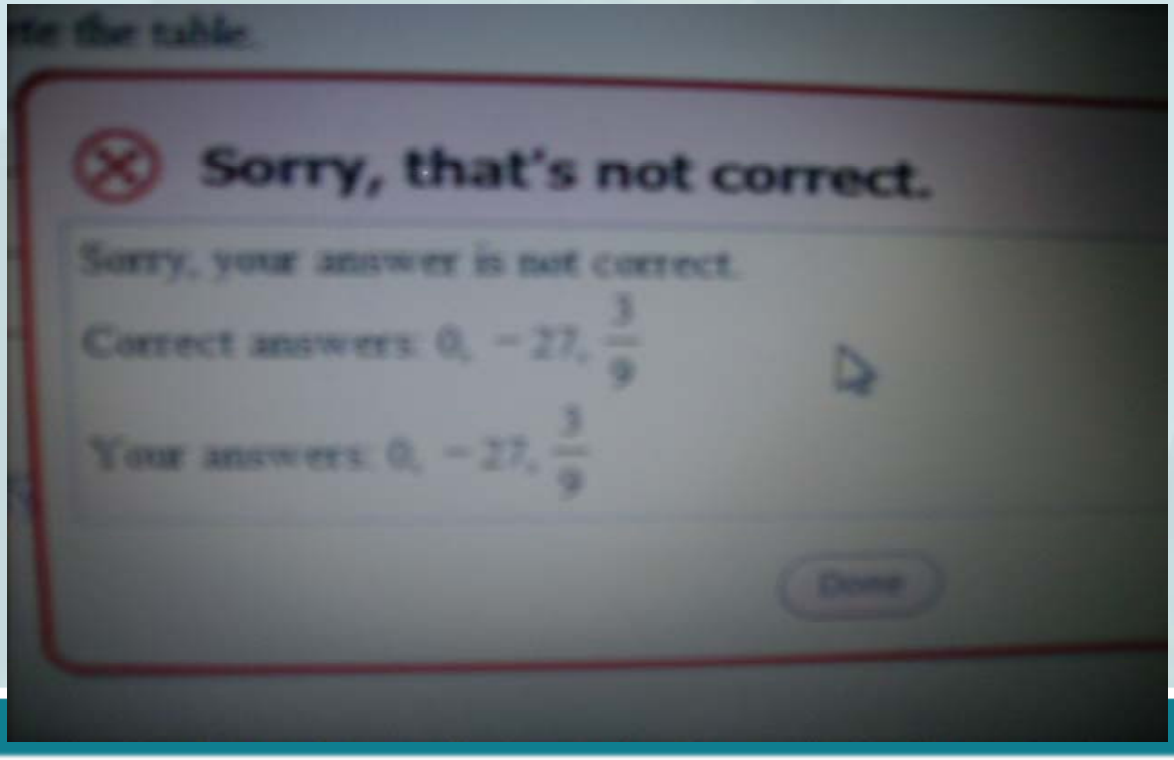


Photo of incorrectly graded problem showing that there are errors, just like in a textbook.



Benefits of Computer Aided Instruction (CAI)

- Offers choices to student in math content delivery (text, video lecture…)
- The computer drills student on traditional homework exercises very well; provides student with hints, immediate feedback
- Liberates teacher from lecture/drill. Teacher has more time in class to discuss mathematical reasoning.

Benefits of CAI (cont'd)

- Student accountability and precision increases

1)Students can not fool themselves into thinking they did HW correctly

2)Students forced to use correct notation

- Students are actively learning as they do Math problems
- On-demand help available to students from the online computer software system

Benefits of CAI for Pedagogy

- Facilitates Mastery Learning Approach

1)students focus on concept till it is mastered

2) easy for teacher to create and have computer grade multiple versions of the same assessments.

- Diagnostic testing features available so students only practice skills they do not know.
- Computer-based learning resources such as text, video, animations and guided questions that are keyed to text are readily available to student

Experiment: Course Redesign

2 sections of Prealgebra and 1 of Beginning Algebra (fall 2006) were taught:

- 1.5 hours per week in class with teacher facilitating small group discussion about reasoning mathematically
- 1.5 hours per week in computer lab helping students do homework/skills on MyMathLab

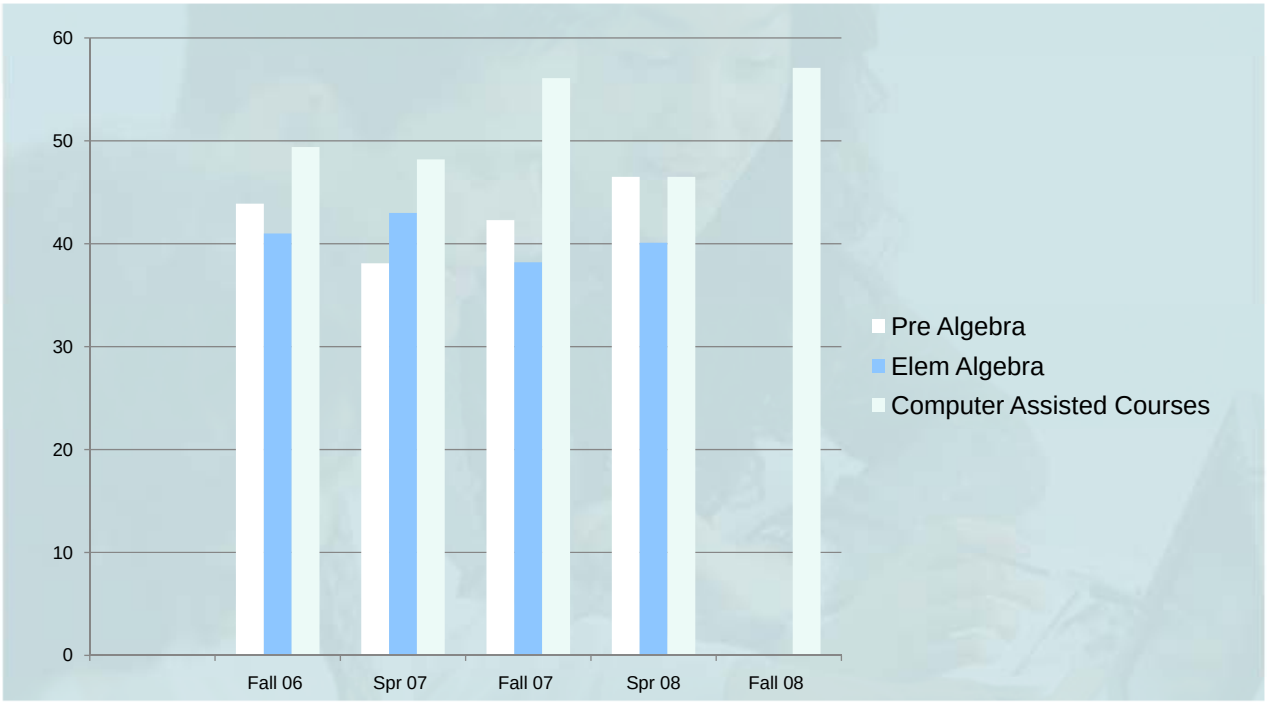
We found that Computer Aided Instruction

Enhances teacher – student interactions

CourseCompletion rates from 2006-2008

	Pre Algebra College Wide (no CAI)	Elem Algebra College Wide (no CAI)	Courses with CAI
Fall 06	43.9%	41%	49.4%
Spr 07	38.1	43	48.2
Fall 07	42.3	38.2	56.1
Spr 08 Fall 08	46.5	40.1	46.5 57.1

PreAlg, Elem Alg, and CAI student completion rates



Future Remedial Math Course : ½ seminar, ½ computer lab

- Replace two remedial courses with one course with 9 modules (arithmetic, signed numbers, algebraic expressions, linear functions, exponents,….)
- Students work on individualized “plan of study” continuing to enroll in this course till they master all modules

Future Course : ½ seminar, ½ computer lab: Advantages

- For students who drop out of college, they can more easily drop back in at any point
- Slower pacing possible to allow mastery of difficult concepts
- Students can fast track thru modules
- Cost savings for students who do not have to repeat failed courses or who are able to fast track through the remedial courses.

Future Plans: Advantages (cont'd)

•Differentiated instruction for different learning styles and needs

•Teacher-time can focus on thoughtful mathematics and developing "habits of mind while computer drills student in skills

•Scheduling flexibility for 1-credit winter and short summer terms

Weaknesses of Computer Aided Instruction (CAI)

- Some students rely too heavily on homework hints, do not learn content from text or lecture, but simply do isolated problems
- Software does not teach math reasoning, nor how to attack complex or novel problems (this is done in seminar)
- A small number of students score 100% on HW, but fail Final Exam (why?)

Publisher software in my college level courses

- The publisher's software is required in my Statistics, and strongly encourage in my PreCalculus and Calculus classes.
- I email students a month before classes begins to inform them about the software
- I do not give classtime to college-level students to work on the web-based Homework.

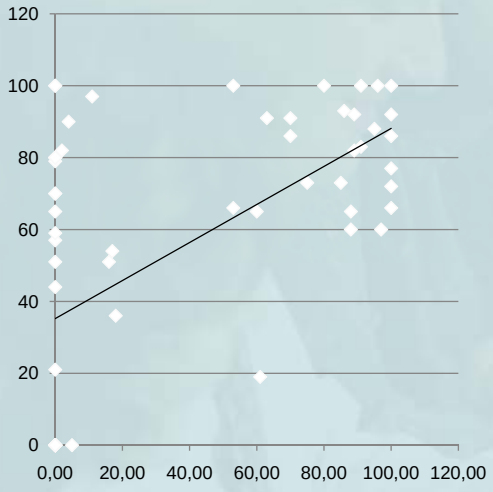
How can I motivate students to do homework on software?

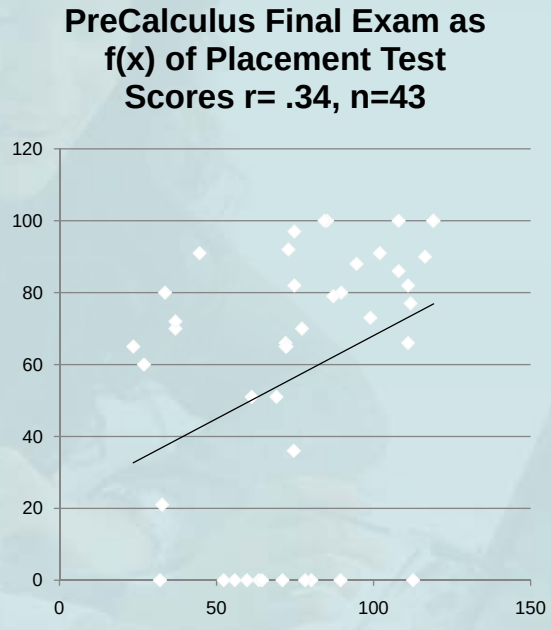
- Give points toward grade for HW
- Sign students up for the software on the first day of class – in a computer lab.
- Demonstrate and include aspects of software in class discussions
- Share following data with students:

Data from PreCalculus Class

	Placement test avg	Avg Web HW score	Avg Final Exam	# Students earning >69% on Final Exam
Spr 10	75	9%	43	8/20=40%
Spr 10	77	36%	50	10/21=48%
Fall 09	75	63%	67	12/23=52%
08-09	?	No one did Web HW	52	19/42=42%

Does Exam Grade correlate with Homework?





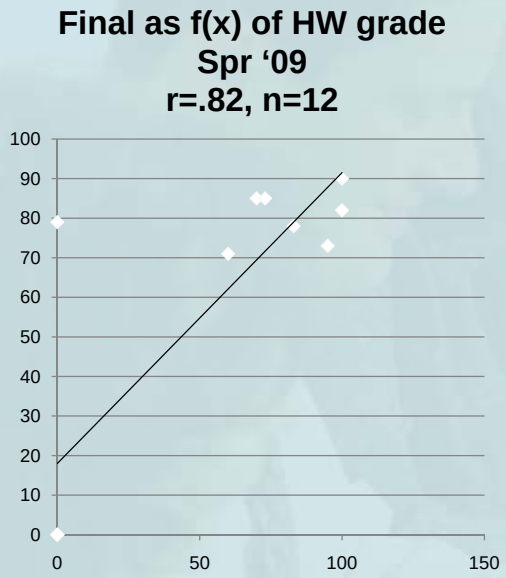
PreCalculus Final Exam

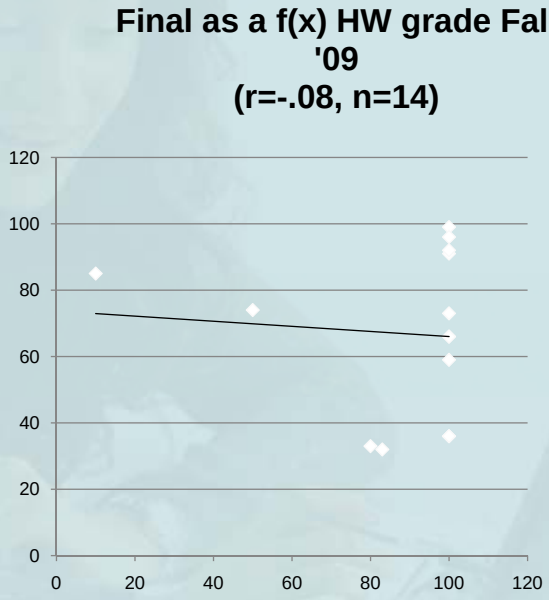
- Multiple Regression of Final Exam on Placement test and Web Homework gives a p-values of .04 for the Placement Test Score and .001 for Web HW.
- Homework on Computer software is highly significantly correlated with Final Exam grades

Is Publishers' Text-based Software for everyone?

- Some students insist on using it, even if teacher is not.
- Some students will never use it.
- Sometimes there are contradictory results as seen on the next slide.

Elem Algebra: 2 sections that used CAI in 2009:





What does Publishers' Text-Based Software Do Well?

Drills student on homework problems with some tutorial help and hints

Grades homework, quizzes and tests.

Provides flexibility for teachers in how to design a course

BUT…..

The software does not replace the teacher.

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Thank you for your attention.

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