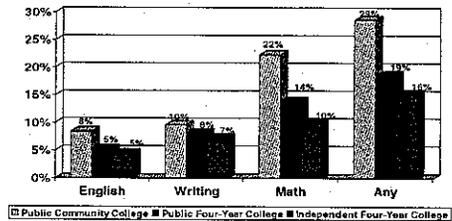


Legislative Program Review and Investigations Committee  
Examination of College Remediation

Presented to the  
Higher Education and Employment Committee  
College Remediation Invitational Informational Forum  
January 28, 2010



Percent of College Students Nationally  
Taking Remedial Courses During First Year

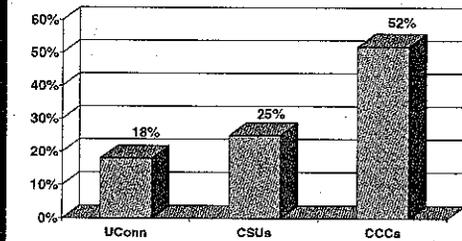


Source: U.S. Department of Education, National Center for Education Statistics, 2003/04 Beginning Postsecondary Students Longitudinal Study, First Follow-up.

Presentation Overview

- Background
- Remediation Prevention Strategies
- Remediation Delivery Strategies

Percent of Connecticut Students  
Taking At Least One Remedial Class



Source: Next Steps: Preparing a Quality Workforce, Stephen Coelen, Sevinç Rende, and Doug Fulton, Dept. of Economics and CT Center for Economic Analysis, University of Connecticut, April 2008.

Remedial vs. Developmental Courses

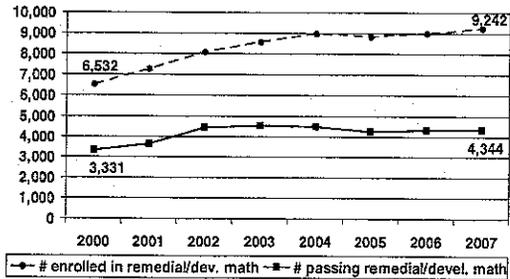
Remedial courses:

- for students who have NOT demonstrated proficiency in the subject area
- non-credit courses

Developmental courses:

- for students who have demonstrated partial readiness or proficiency
- for credit courses
- do not apply to gen ed graduation requirements

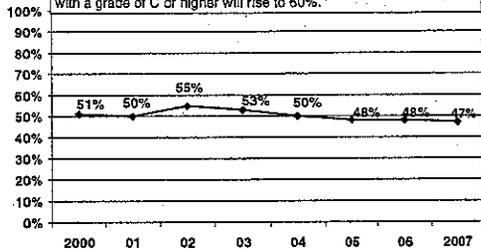
Number CC Students Enrolled in *and Passing*  
Remedial/Developmental Math Course



Source: CT DHE Report, Higher Education Counts: Achieving Results, 2006-2009.

Connecticut Community College System Goal 1 Student Learning

**Performance Improvement Goal**  
By 2011, it is expected that, among students enrolled in a developmental mathematics course, the percentage of completers with a grade of C or higher will rise to 60%.



Source: CT State Dept of Higher Ed Report, Higher Education Counts: Achieving Results, 2006-2009

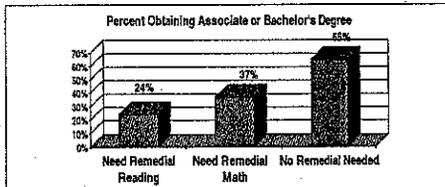
Why are Students Unprepared for College?

Science performance of U.S.'s 15-year-olds is below average

- Finland (563)
- Hong Kong-China (542)
- Canada (534)
- Japan (531)
- Estonia (531)
- Australia (527)
- United Kingdom (515)
- Hungary (504)
- **United States (489)** (Average score = 500)

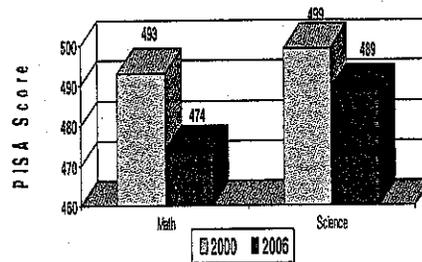
Needing Remedial Coursework is Associated With:

- previous difficulties in traditional academic settings
- less likelihood of obtaining college degree



Source: From Closing the Expectations Gap: 2008. An annual 50-state progress report on the alignment of high school policies with the demands of college and work. by Achieve, Inc., American Diploma Project Network.

Figure VI-1. U.S. Math and Science Literacy Scores: 2000 to 2006



Graduation Rates and Ranking for Degrees Conferred in 2007

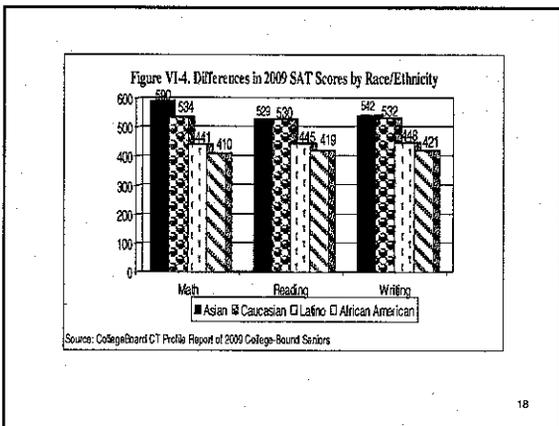
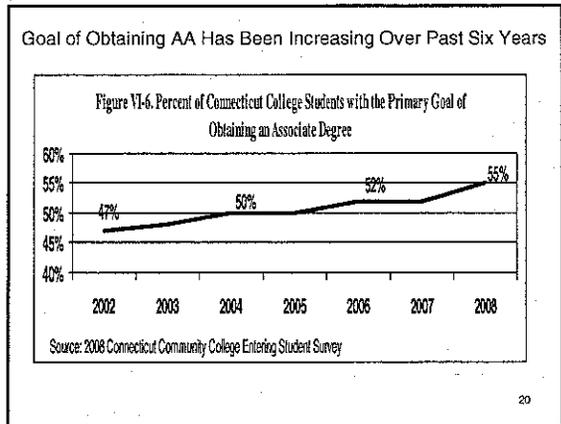
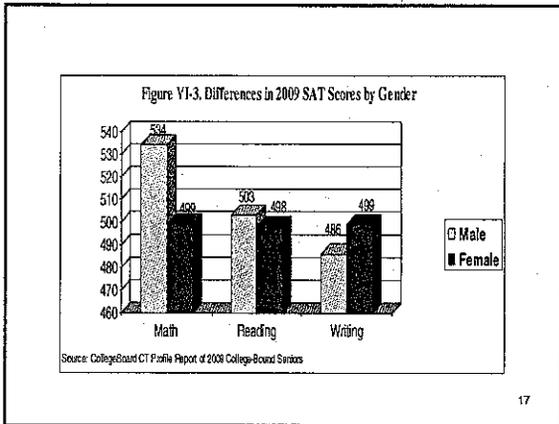
State	6-Year Graduation Rates for Bachelor's Students		3-Year Graduation Rates for Associate's Students	
	Percent	Rank	Percent	Rank
Connecticut	63%	9	16.1%	43
Massachusetts	68%	1	18.3%	41
Rhode Island	64.9%	4	14.5%	47
Vermont	63.7%	6	15.6%	44
New Hampshire	62.7%	11	31.7%	15
Maine	57.9%	19	28.9%	21
National Average	56.1%	--	27.9%	--

Source: IPEDS Graduation Rate Survey

Why are CT Students Unprepared for College?

Table VI-3. State Ranking on Gap Between Higher- and Lower-Income Student Performance

State	Fourth Grade				Eighth Grade			
	Reading		Math		Reading		Math	
	1996	2007	1996	2007	1996	2007	1996	2007
Connecticut	51	50	42	50	51	50	39	50
Massachusetts	45	36	10	34	38	37	34	49
Rhode Island	34	40	28	38	43	47	27	44
Vermont	21	19	10	13	11	13	6	6
New Hampshire	13	15	-	4	5	6	-	13
Maine	6	7	5	7	1	1	5	3



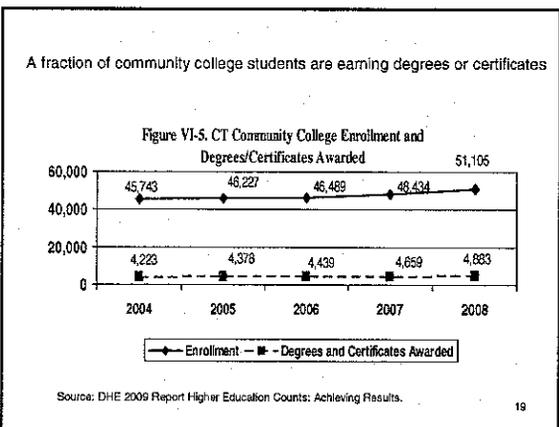
## Remediation Prevention Strategy

*Strengthen high school graduation standards*

PRI Committee Recommendation:

**Connecticut should pass legislation reforming Connecticut high school graduation requirements (Rec. #8)**

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## ACCUPLACER Placement Test

- Developed by CollegeBoard
- Determines preparedness for college-level coursework
- Tests academic skills in math, English, and reading
- Includes writing an essay on a familiar topic; all other questions are multiple choice

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## Accuplacer used at Connecticut Community Colleges

- The Accuplacer computerized adaptive test used to assess placement of entering students
- Each community college uses, at a minimum, the reading comprehension, sentence skills and algebra sections of the Accuplacer test
- Accuplacer or SAT cutoff scores specified in policy manual

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## Remediation Prevention Strategy

**Take the ACCUPLACER while still attending high school**

- Helps students know where their skill levels are
- Encourages students to continue to develop skills
- Helps students stay focused and more prepared

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Example of ACCUPLACER Sentence Skills Question:

Rewrite the following sentence:

***It is easy to carry solid objects without spilling them, but the same cannot be said of liquids.***

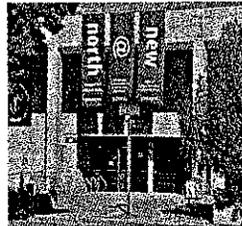
**Unlike liquids,**

(The next words will be)

- A. it is easy to
- B. we can easily
- C. solid objects can easily be
- D. solid objects are easy to be

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North Community High School



Minneapolis Community and Technical College



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Example of ACCUPLACER Math Question:

$$(3x - 2y)^2 =$$

- A.  $9x^2 - 4y^2$
- B.  $9x^2 + 4y^2$
- C.  $9x^2 + 4y^2 - 6xy$
- D.  $9x^2 + 4y^2 - 12xy$

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## 1/3 of MA. H.S. Students Surveyed Said the Accuplacer and related counseling:

- "...helped me change/better plan my senior year courses"
- "...made me take a harder math course"
- "...helped me decide the classes/courses where I needed to work harder"
- "...showed me if I was ready for college classes or not"

Source: Impact of Accuplacer Assessment on HS Students, Jibril Gabriel Solomon, Higher Education Director at NSF ATE Center (TechBoston/Boston Public School)

**Building a Bridge to Improve Student Success**

A collaborative project between:  
Western Connecticut State University  
Berkshire Public Schools  
Hartford Public Schools

WESTERN CONNECTICUT STATE UNIVERSITY

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### Hennepin Technical College College Readiness Testing Program

- Who will administer the tests?
- Who pays for test costs?
- What information will you give to students/parents?
- When will you test?

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### Goals of Bridges Program

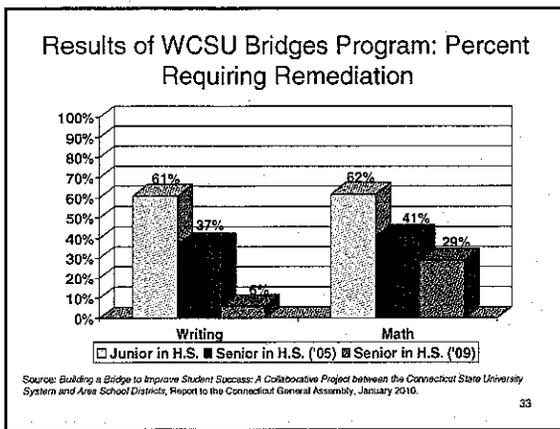
- Decrease # of students needing remediation in college
- Smooth students' transition from H.S. to college
- Provide H.S. students with clearer idea of college expectations
- Build relationships between writing and math CSUS and H.S. faculty

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### Hennepin Technical College College Readiness Testing Program

- Where will you test?
- How will students be notified of test arrangements?
- Who will provide/discuss test results with students?
- Who will provide post test intervention follow up?

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### Cost of Accuplacer vs. Remedial Course

- \$1.75 per assessment unit (cost of online Accuplacer test)
- Average cost estimated to be \$12 per student
- \$354 is current cost for three-credit remedial or developmental course at CCC

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## Remediation Prevention Strategy

*Increase efforts in high school to reduce the need for remediation in college*

PRI Committee Recommendation:

**All Connecticut high school juniors should be encouraged to take the Accuplacer or comparable test (Rec. #9)**

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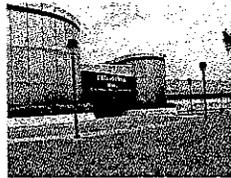
## Bridges to Health Career Initiative

- \$2.1 million grant to CCCS
- Focused on students receiving developmental/remedial coursework
- Used KeyTrain to assess and improve math and reading skills
- Goal for students to transition into associate degree or credit certificate programs

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## Columbus Technical College, GA

- Students take KeyTrain as Pretest
- Skill-building done using KeyTrain
- When ready, students take placement exams



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### KeyTrain®

Learn, practice and demonstrate the skills you need to succeed in the workforce with KeyTrain®

- Expand or refresh your academic skills in math, reading and writing in order to graduate and succeed in your career.
- Get ready for placement testing.
- Build confidence.
- Accelerate your education.
- Prepare for the job search
- Compete for higher-level, higher-paying jobs.

All Connecticut Community College students have free access to KeyTrain. Please [click here](#) to view a brochure about KeyTrain.

For more information or to obtain a KeyTrain account, contact the [KeyTrain Administrator](#) at your college. The [Student Tip Sheet](#) can assist registered students in getting started.

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## KeyTrain

- Internet-based
- Self-paced
- Interactive skills tutorial
- Used at many community colleges in U.S.

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## Other Computer-Assisted Placement Preparation Tools

- ALEKS (Assessment and Learning in Knowledge Spaces)
- WorkKeys
- PLATO
- Math XL

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## Remediation Prevention Strategy

*Use computer assisted tools to build skills or brush up on rusty skills*

PRI Committee Recommendation:

**Promote computer-assisted preparation programs at all the community colleges (Rec. #10)**

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## Remediation Delivery Strategy

- Couple traditional remedial coursework with self-help, self-paced computer programs
- Albuquerque Technical Vocational Institute added *KeyTrain* to remedial English course



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## College Success Following Completion of Remedial Coursework

- College GPAs of students successfully completing remedial courses similar to students not needing remedial coursework
- Pass-rates for initial college-level English courses was the same for remedial/non-remedial students
- Pass-rates for initial college-level Math courses was lower for remedial students

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## Albuquerque Technical Vocational Institute

- Class Retention Rate:
  - ENG 98 (60% completed course)
  - ENG 98 + KeyTrain (81% completed course)
- Pre vs. Post Accuplacer Scores
  - ENG 98 (35% increased scores)
  - ENG 98 + KeyTrain (46% increased scores)

47

## MN Study Recommended Approach to Remedial Education

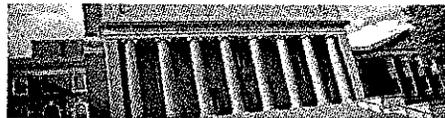
- More "fine-grained" assessment
- Modularized instruction
- Use of technology
- Workplace-oriented approach

Source: From ECS Steering Committee, Minneapolis, MN, April 22, 2009, "Linking Higher Education with Workforce & Economic Development, National Center for Higher Education Management Systems

45

## Remediation Delivery Strategy

- Couple traditional remedial coursework with self-help, self-paced computer programs
- University of Alabama uses *MyMathLab* in its introductory algebra course (MATH 100)



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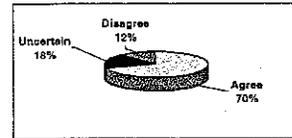
## What is Contextual Learning?

- Learning new information by connecting it within our own frame of reference
- Assumes we naturally search for relationships that make sense and appear useful
- The kind of learning that occurs when students see meaning or application in lessons

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## After Pilot

Hands-on Applications Helped Me Understand Math Better:



"I really enjoyed how I was taught. No other teacher I had took the time to explain by hands on experience."

"I have never done well in math. After this semester I felt much more confident because my grades were much higher."

Source: Success in Postsecondary Developmental Mathematics: A Curriculum Evaluation, (1998) Center for Occupational Research and Development, Inc., Waco, TX

52

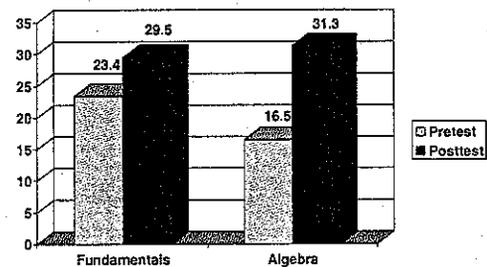
## CORD Contextual Developmental Math Course Pilot

- Used CORD Mathematics Foundations for Introductory College Mathematics curriculum
- Pilot evaluation conducted at 11 community colleges in FL, IL, ME, NY, TX
- 571 students and 15 instructors participated
- Developmental course used hands-on, real-life situations to show everyday importance and application

Source: Success in Postsecondary Developmental Mathematics: A Curriculum Evaluation, (1998) Center for Occupational Research and Development, Inc., Waco, TX

50

## Results of Contextual Developmental Math Pilot



Source: Success in Postsecondary Developmental Mathematics: A Curriculum Evaluation, (1998) Center for Occupational Research and Development, Inc., Waco, TX

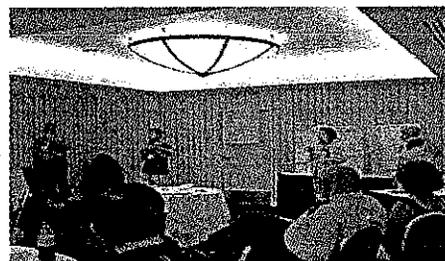
53

## 70% Before Pilot Were Frustrated with Mathematics, Especially:

- "The fast pace and bad instructors"
- "I was always lost"
- "Old style of teaching—go to board to do it—in high school"
- "Understanding the relationship of the numbers to real life"

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## Example of Contextual Learning



Number line rope being used to develop number sense, fraction sense, relative size of numbers, comparing fractions and estimation

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## Tennessee Technology Centers



- Everything students learn is in the context of their future careers
- If learning trigonometry, it's because they'll be using it every day on the job as aviation mechanics or computer drafting techs
- Students can use tech center credits for certificates or toward associate's degrees
- Graduation rate: 70%

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## Contextual Learning at Asnuntuck Community College

- Manufacturing Technology Center
- Certificate and degree programs apply theory in practice



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## "100% Math Initiative"

- Created in 2002 by math professionals within the MA Community College System
- Developmental math the largest program in community colleges nationally, with failure rates as high as 50%
- Wanted to build a foundation for student success in remedial math

Source: 100% Math Initiative: Building a Foundation for Student Success in Developmental Mathematics, 2006  
Massachusetts Community Colleges Executive Office

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## Remediation Delivery Strategy

*Contextual or embedded remedial material within an applicable setting of interest to the student may be more successful than a stand-alone remedial or developmental course*

PRI Committee Recommendation:

**The Connecticut Community College System should consider replacing stand-alone remedial courses with introductory credit courses that integrate remedial skills instruction. (Rec. #11)**

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## Recommendations from 100% Math Initiative

- Orient presentation to real world applications
- Small group work should include applying skills to real-life problems
- Self-paced instruction be contextually rich
- Textbooks should be also contextually rich

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## Contextual Remedial Course References

- Constructing a Framework for Success: A Holistic Approach to Basic Skills
- [http://www2.bakersfieldcollege.edu/jfulks/BSI%20Handbook/basic\\_skills\\_handbook\\_TOC.htm](http://www2.bakersfieldcollege.edu/jfulks/BSI%20Handbook/basic_skills_handbook_TOC.htm)
- <http://www.masscc.org/pdfs/mathinitiativefinal.pdf>

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### **For More Information...**

- Staff Findings and Recommendations of the Alignment of Postsecondary Education and Employment
- [www.cga.ct.gov/pri/2009\\_APEE.asp](http://www.cga.ct.gov/pri/2009_APEE.asp)