


Supplemental Instruction for Intermediate and College Algebra at NMSU

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In the beginning.....

It started with a 2002 RFP from HP that stated:

.....a course that is required for almost all technical majors and in which a large percentage of its students do poorly and as a result are unable to continue in a technical major is considered a “gatekeeper” course....



Who Participated?

- College of Education
- College of Engineering
- Department of Mathematical Sciences
- Hewlett Packard

Which Course?

● Math 115!

- Complex numbers, linear equations, inequalities, system of equations, polynomials and factoring, exponents, powers and roots, quadratic equations, graphing, exponential and logarithmic functions.
- Placement determined by: Combination of high school GPA and ACT Math score or Math Placement exam score

Why?

- 40% of Engineering and Computer Science students start with Math 115
- Only 30% pass Math 115 with an A or B
- 56% withdraw, fail or Re-Register to complete in a second semester

Where does Math 115 fit in the Engineering Calculus sequence?

- CCDDM 114 Introductory Algebra
- 115 Intermediate Algebra
- 185 College Algebra / 180 Trigonometry
- 191 Calculus and Analytic Geometry I
- 192 Calculus and Analytic Geometry II
- 291 Calculus and Analytic Geometry III
- 292 Calculus and Analytic Geometry IV

Who was our Lead Facilitator for the SI Courses?

- Kathe Kanim
 - Masters degree in mathematics
 - Experience teaching at the middle (1 year) and high school level (10 years)
 - Participated and facilitated at the Park City Mathematics Institute (6 years)
 - Experience and interest in using technology
 - Inquiry based, constructivist teaching philosophy

What was our plan?

- Design supplemental Instruction classes to enrich Intermediate Algebra
- Three contact hours per week
- Use HP laptops to enrich instruction
- Work in groups
- No outside expectations

HP Mobile Computer Classroom

- Extend problems
- Graphing applications
- Explored databases
- Link Math 115 mathematical concepts with EE 110, *How Things Work*

Supplemental Instruction

- Class time used working with fellow students on Math 115 assignments/reviewing tests
- Activities develop team work/problem solving
- S /U grade determined by attendance, one credit

Examples of Class activities

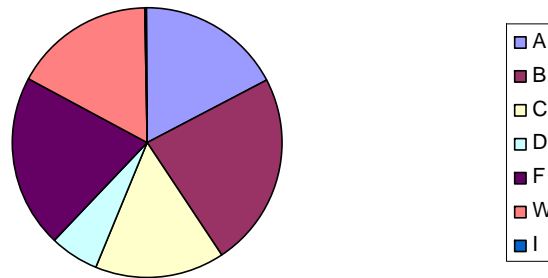
- Written Test Revisions Workshop
- Linear relations activities
- Resistors activity
- Shifting parabolas exploration
- Solving Systems of equations involving circuits (from a discussion in an Engineering cluster meeting)

Focus of the course

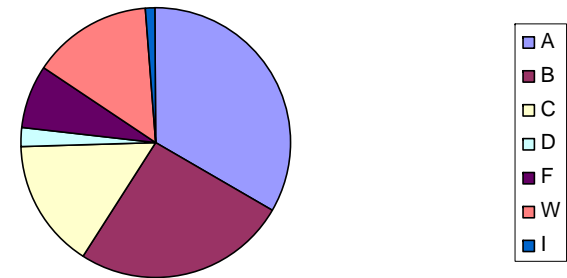
- Increase pass rate of Math 115
- Extra three hours a week dedicated to Mathematics
- Timely help with difficulties
- Instructor as listener
- Organization and reality checks for the students
- Students at the center, instructor on the side

Distribution of Math 115 grades

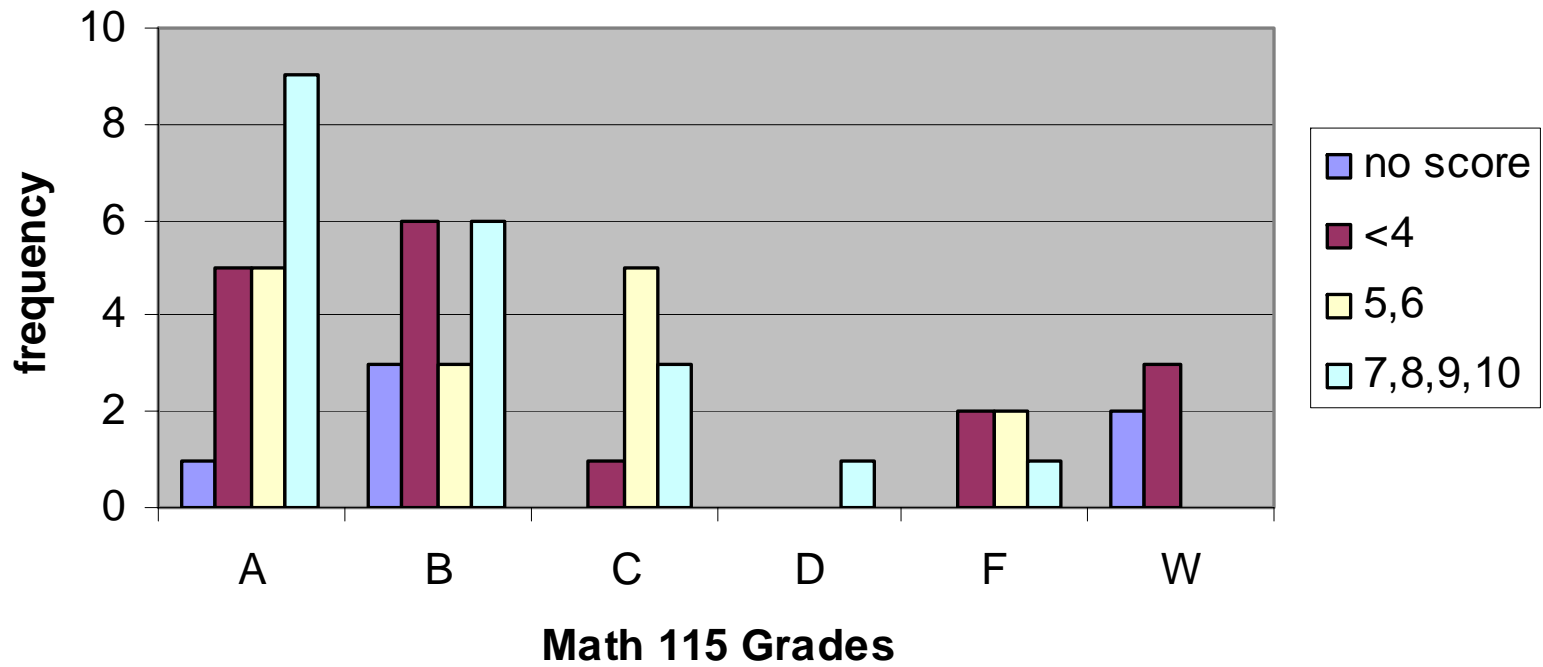
All Math 115 Lecture students Fall '05
n=546



Math 101 Students Fall '05
(n=90 16% Math 115 lecture students)



Math 115 Grades and Diagnostic Test



Next Steps....Challenges

- We will have eight sections spring, 2006 (using the last of the HP funds)
 - Are we reaching the right target?
 - Are mandatory SI course called for?
- Can aspects of the course be incorporated in the regular class?
- Looking for grants, funding sources
 - TA's
 - Instructor salary
- Where does SI fit with Math 120 and Math 121 (Senate Bill 161)
- Tech help
- Time to develop integrated problems

As time goes by.....

- Five former SI students were hired in the fall as tutors of the expanded program
- Those who pass Math 115 and supplemental instruction, continue on in their postsecondary journey
- Sections of Supplemental Instruction have been offered for Math 185