

Math 121 Course Redesign Report-Fall 2013

Summary of Instructional Redesign Components

The goal of the Math 121 Course Redesign team was to improve the engagement, learning and success of students in the course at UNM. Our aim was to use a comprehensive approach to engage students more completely in mathematics both outside of and within the classroom. The key instructional redesign components of our project were:

1. Develop students' ability to evaluate their own understanding.

Our team created assignments and gathered other materials that help students monitor their own progress in understanding. These included computer-based assignments as a way of giving students immediate feedback on their work, assignments that incorporated questions such as "why this works", "what would happen if...", and "how is this concept like and unlike another", and assignments that ask students to write their own questions pertaining to the skills and concepts they are learning.

2. Engage students in the mathematics in ways that facilitate long term memory and transfer to other situations or contexts.

We explored strategies to "invert" the classroom. We wanted students to learn some fundamental material before they came to class. We required it with worksheets due when they came in (pre-class assignments). After lecturing for approximately the first third to a half of class, the students would get into groups and work through the in-class assignments developed by the redesign team. This put students in a situation where they had to explain what they were doing to other students, and to discuss the context of applied problems. This also enabled the instructor to see where students were having difficulty and to straighten things out before the students when home to work on the homework problems.

3. Develop Productive Study Skills

We strove to influence how students relate to mathematics outside of class. Teachers often tell their students to study and give them guidelines for the number of hours they should study. We went further and give students specific and concrete information about how to study effectively. We constantly reminded the students of study strategies and techniques instead of telling them once at the beginning of class and then assuming they would remember the advice throughout the rest of the semester.

4. Increase teaching effectiveness in lower division courses.

The focus on student learning is key to improving the effectiveness of teaching in early college classes. As we hone our materials and strategies over the next year, we will coach other UNM teachers on how to incorporate them into their classes. We have tried to write assignments in such a way that it will be straightforward for any new instructor to come in and begin using the redesign curriculum.

5. Enhance and improve the student learning outcomes, tie them to student work, and clearly communicate them to students.

While team did enhance and improve the student learning outcomes, we found that communicating them to the students did not have any significant effect on their response to the material. If anything, it took up valuable class time. Everyone on the team agreed that this was the case and we decided to scrap this redesign component.

Summary of Results

I. Student Survey

Students in the redesigned sections were given the following survey during the fall 2012 semester. The results follow.

Math 121 Student Survey

This is a survey to assess the effectiveness of a variety of tools in place to help you learn College Algebra. This is NOT a survey to assess the effectiveness of your instructor.

Please rate the following elements of your Math 121 course in terms of their effectiveness.

1. How effective were the pre-class assignments in terms of preparing you for the lecture?

1	2	3	4	5
Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective

2. How effective were the lectures in terms of preparing you to understand the homework?

1	2	3	4	5
Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective

3. How effective were the in-class group assignments in terms of preparing you to understand the homework?

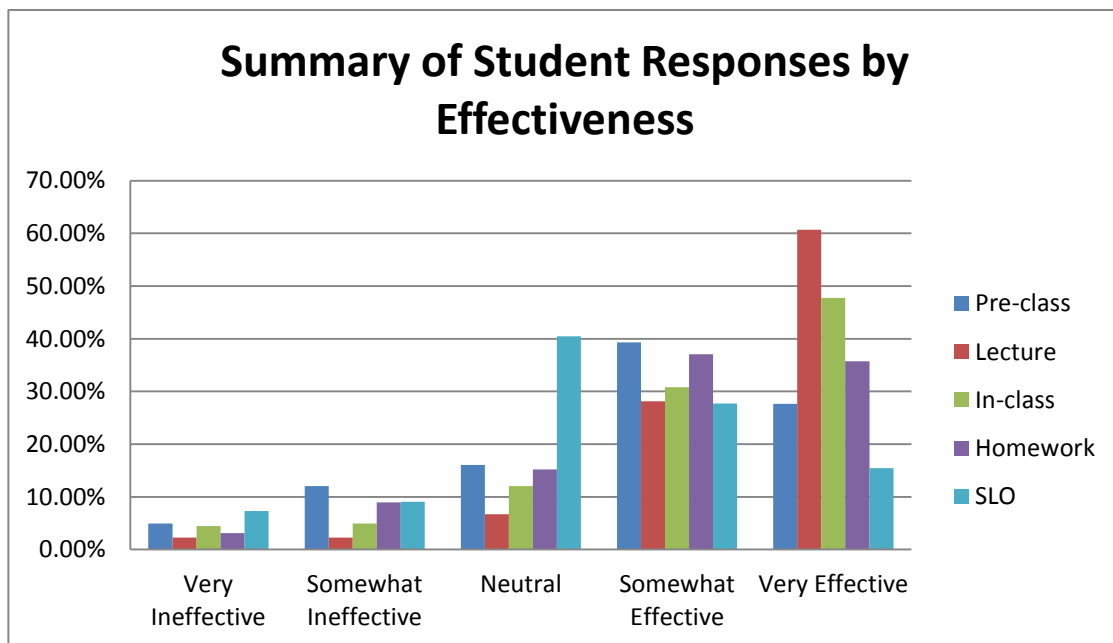
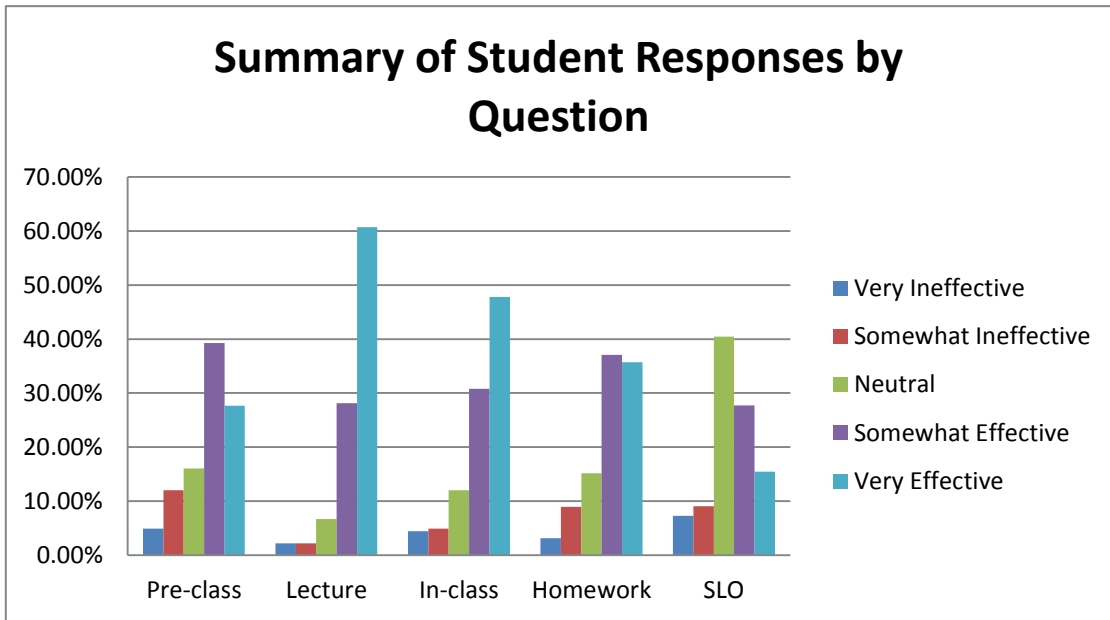
1	2	3	4	5
Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective

4. How effective was the homework in terms of preparing you for quizzes and exams?

1	2	3	4	5
Very ineffective	Somewhat ineffective	Neutral	Somewhat effective	Very effective

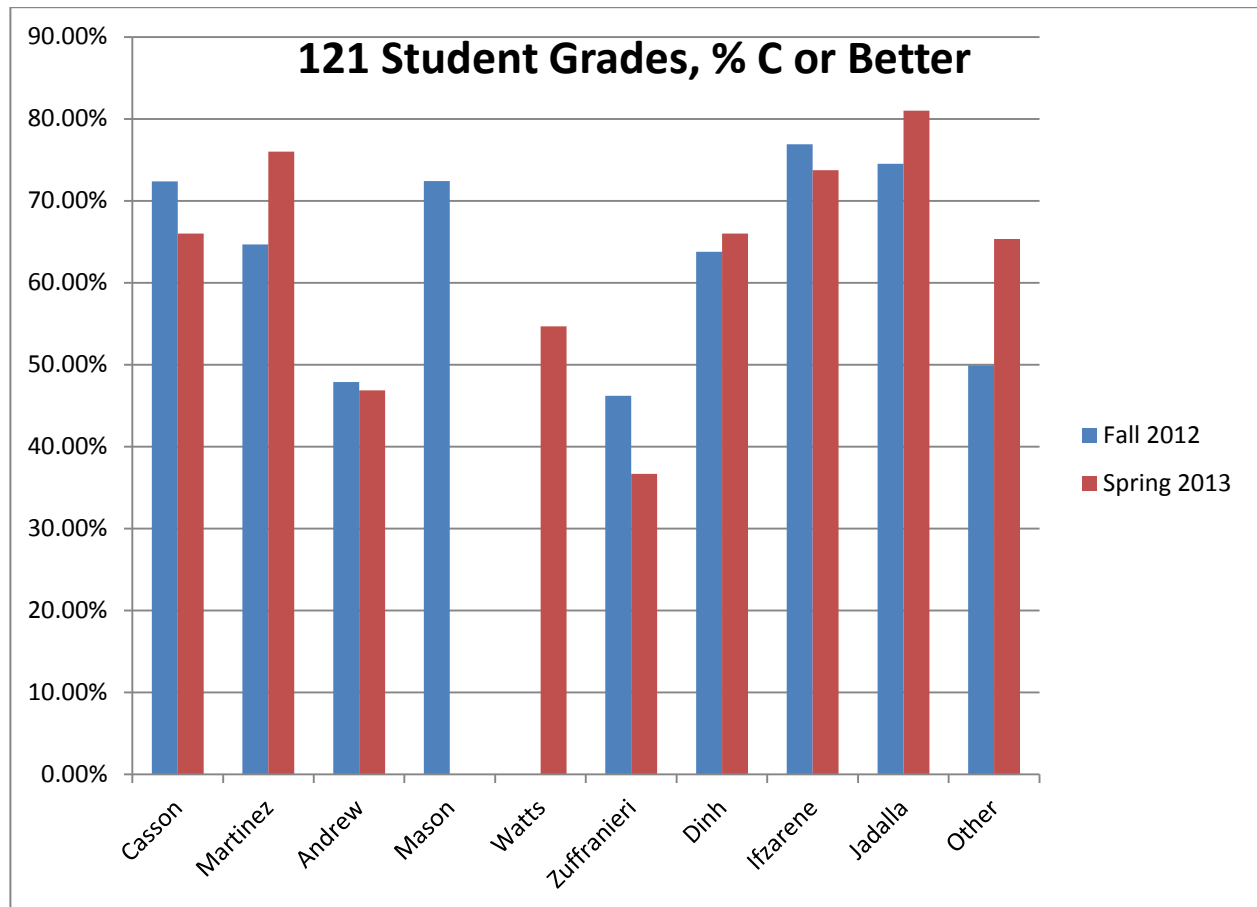
5. How effective were the Student Learning Outcomes (SLOs) in terms of guiding your study for exams?

1 2 3 4 5
 Very ineffective Somewhat ineffective Neutral Somewhat effective Very effective



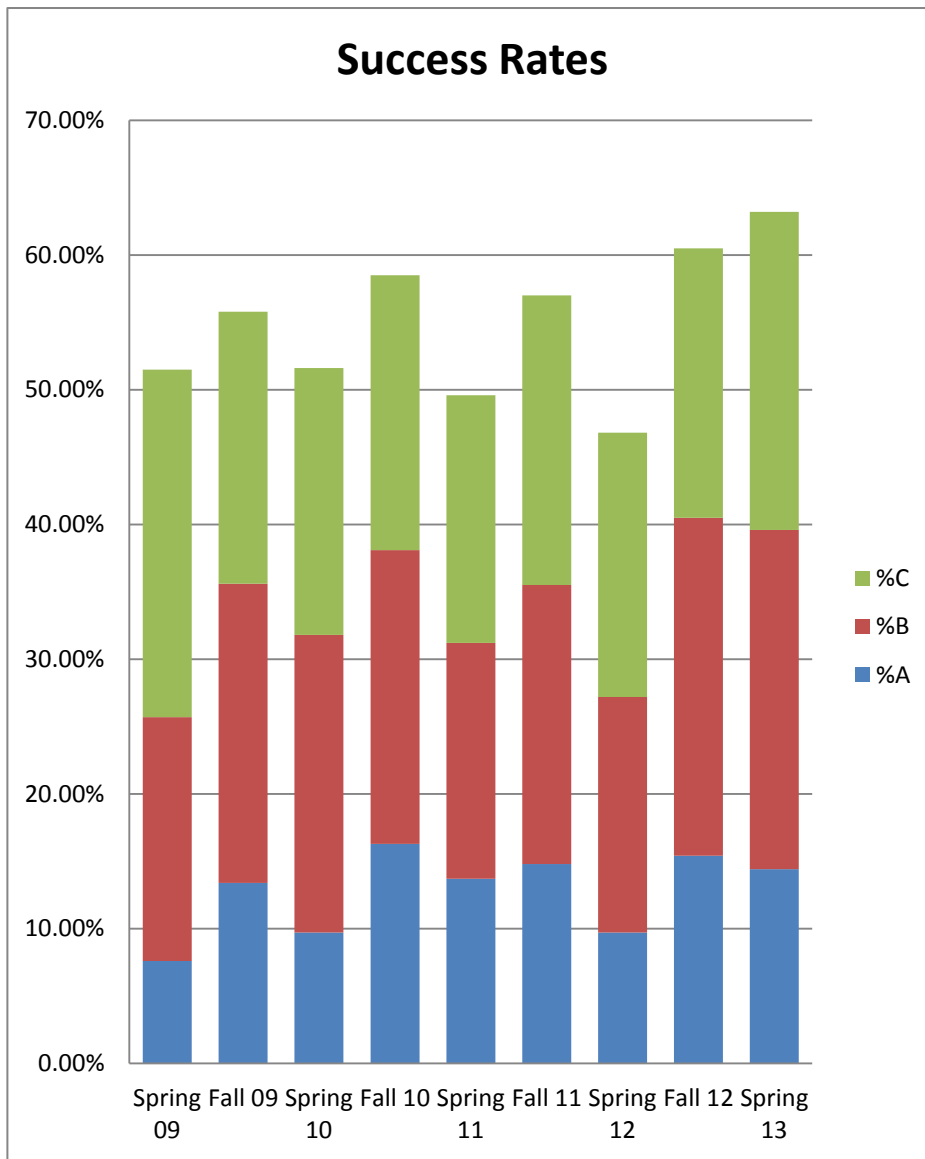
While students believed the lecture was the most effective component of the class as, it was encouraging that the majority of students were quite open to the group work component of the class. Based on this survey, we dropped the focus on conveying the SLOs to the students and more time focusing on the in-class assignments.

II. Grades by Instructor

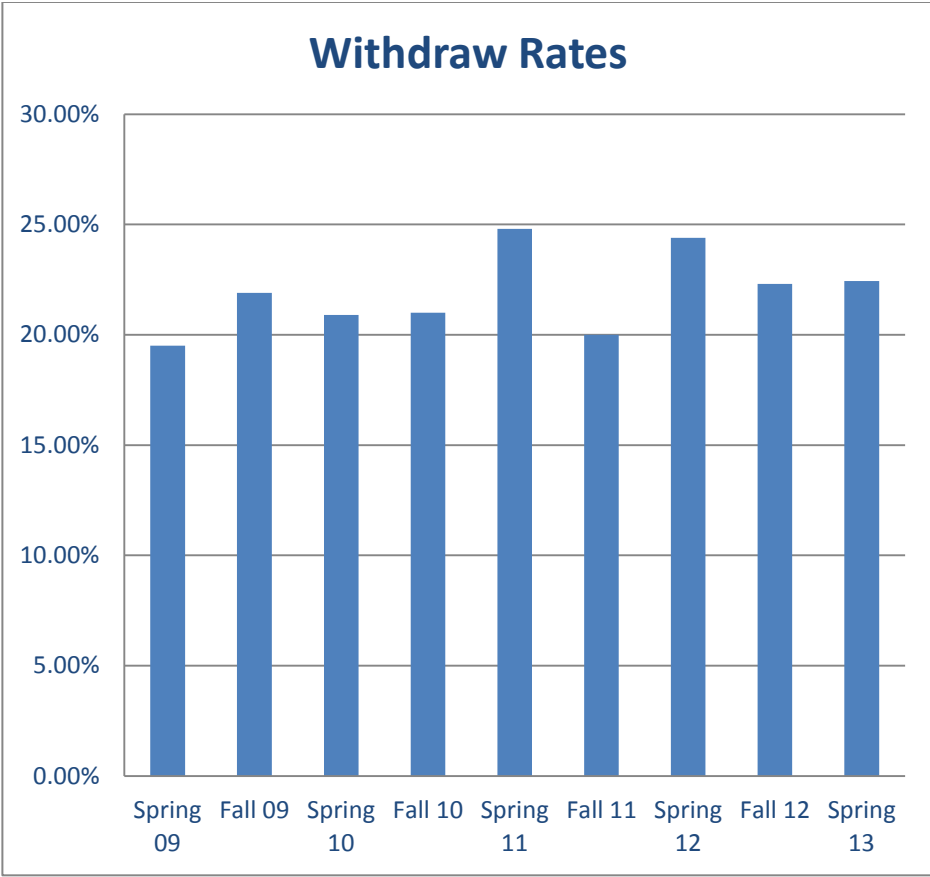


The members of the redesign team listed above are Casson, Martinez, Andrew, Mason and Watts. Dinh, Ifzarene, and Jadalla are very traditional lecturers and consistently have the highest pass rates in the department.

III. Success and Withdrawal Rates



These are the success/withdraw rates for all sections. We are pleased to see the success rates higher than in recent past.



The withdraw rates continue to be a problem for most sections of 121. Beginning Fall 2013, the coordinator of Math 121 has been working to make instructors more aware of the importance of keeping students enrolled after the third week of class and to make students aware of the various resources they have for support.

IV. STEM Gateway Course Impact Report

COURSE ONE															
TERM(s)	Course Numbers(s)	Section Number(s)	Instructor(s)	STEM G Project(s)											
Spring 2013	MATH 121	5-8-12-13-14-20		Redesign											
Student Subpopulation Definition		All students in these sections													
N: census	N: end of semester	MAJOR OUTCOMES					GRADE DISTRIBUTIONS – Counts of end of semester								
349	349	Completion%	Success% (C or higher)	WD%	A%	End of Semester Enrollment	A	B	C	D	F	WD	CR	NC R	A U
		73.4%	58.2%	26.6%	15.2%	256	53	79	69	31	19	93	2	3	
Additional definitions of this population:															
Notes: Compare to TWO and THREE															

COURSE TWO															
TERM(s)	Course Numbers(s)	Section Number(s)	Instructor(s)	STEM G Project(s)											
Spring 2013	MATH 121	All sections other than those in COURSE ONE	NA	Redesign											
Student Subpopulation Definition		All students in these sections (other than those in COURSE ONE)													
N: census	N: end of semester	MAJOR OUTCOMES					GRADE DISTRIBUTIONS – Counts of end of semester								
675	696	Completion%	Success% (C or higher)	WD%	A%	End of Semester Enrollment	A	B	C	D	F	WD	CR	NC R	A U
		84.6%	62.9%	18.0%	17.2%	571	120	162	150	74	56	125	6	3	
Additional definitions of this population:															
Notes: Compare to ONE															

COURSE THREE															
TERM(s)	Course Numbers(s)	Section Number(s)	Instructor(s)	STEM G Project(s)											
Spring 2013	MATH 121	ALL	ALL	Redesign											
Student Subpopulation Definition		All students in these sections													
N: census	N: end of semester	MAJOR OUTCOMES					GRADE DISTRIBUTIONS – Counts of end of semester								
1024	1045	Completion%	Success % (C or higher)	WD%	A%	End of Semester Enrollment	A	B	C	D	F	WD	CR	NCR	AU
		80.8%	61.3%	20.9%	16.6%	827	173	241	219	105	75	218	8	6	
Additional definitions of this population:															
Notes: Compare to ONE and FOUR															

COURSE FOUR															
TERM(s)	Course Numbers(s)	Section Number(s)	Instructor(s)	STEM G Project(s)											
Spring 2012	MATH 121	ALL	ALL	Redesign											
Student Subpopulation Definition		All students in these sections													
N: census	N: end of semester	MAJOR OUTCOMES					GRADE DISTRIBUTIONS – Counts of end of semester								
879	892	Completion%	Success % (C or higher)	WD%	A%	End of Semester Enrollment	A	B	C	D	F	WD	CR	NCR	AU
		78.3%	48.5%	22.9%	9.9%	688	88	159	179	176	66	204	7	11	2
Additional definitions of this population:															
Notes: Compare to THREE															

While the redesigned courses were slightly below the traditional sections (58.2% vs 62.9% pass rate), the overall pass rate was 61.3%. This is a significant improvement over the 48.5% pass rate from the spring. This is also the highest pass rate Math 121 has seen since 2004. The percentage of A's in the redesigned sections was only slightly less than those of the traditional sections. While we were hoping for better numbers in the redesigned sections, we feel that this shows we have good foundation to build upon for the future.

Looking Ahead

Currently (Fall 2013), eight of the thirty one sections of math 121 being taught face to face are redesigned sections. Because of the fact that there are almost always new instructors teaching the 121 course each semester it is difficult to maintain the continuity of instruction with regard to the redesign curriculum. The redesign team is hopeful that the materials created over the last year are straightforward enough to be used easily by a new instructor after a sufficient amount of training. In addition to the new materials, we have a mid-semester workshop planned with OSET and the STEM Gateway Project to hopefully bring new instructors into the fold and introduce them to the new curriculum and approach to teaching college algebra. All instructors teaching 121 this semester are incrementally being sent the materials developed by the redesign team and so far the response has been very positive. We hope this will help generate interest in the project and in the mid-semester workshop offered by OSET and STEM Gateway.