

# Math Redesign Project

Joliet Junior College



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# What Is Redesign?

- Redesign defined
- Consideration of pathway
  - Traditional path
  - Major specific path
    - STEM versus Non-STEM
  - StatWay/MathWay
- [www.thencat.org](http://www.thencat.org)

# Why Redesign at JJC?

- Administrative challenge from VP of Academic Affairs
- Change Clearly Needed – Success rate in developmental math between 45.7% and 52.5%
- Faculty ready for a simpler change
- Pilot a possible solution – a reasonable choice for some
- Heterogeneous students
- Heterogeneous course

# Desired Outcomes

- Increase pass rate/decrease DFW rate
- Increase student success in subsequent college-level courses
- Uniform course college-wide
- Self-acceleration
- Develop effective study skills
- Shelf life of modules

# Math Redesign Project at JJC

- Model Decision: Fixed Emporium
  - Easy to Enroll Students
  - Financial Aid Consideration
  - Instructor Accessibility

# Math Redesign Project

## Current Overview

- Three development courses: College Arithmetic, Elementary Algebra, Intermediate Algebra
- Total - 511 students this semester
- The learning model for satellite campus
- A secondary choice at main campus (new pilot site)
- Two computer lab classrooms at each campus
- Student:instructor ratio 22:1

# Typical Module

- Section Level
  - Objective Level Video Lecture
  - Homework at the Objective Level
  - Mixed Practice Homework
  - 90% Mastery
- Module
  - Two or three quizzes per module (80%) mastery
  - Personalized homework
  - 70% mastery on exams
  - Personalized homework

# Student Responsibilities

- Sign policy contract
- Access to course management system
- Attendance
- Work outside of class
- Maintain quality notebook

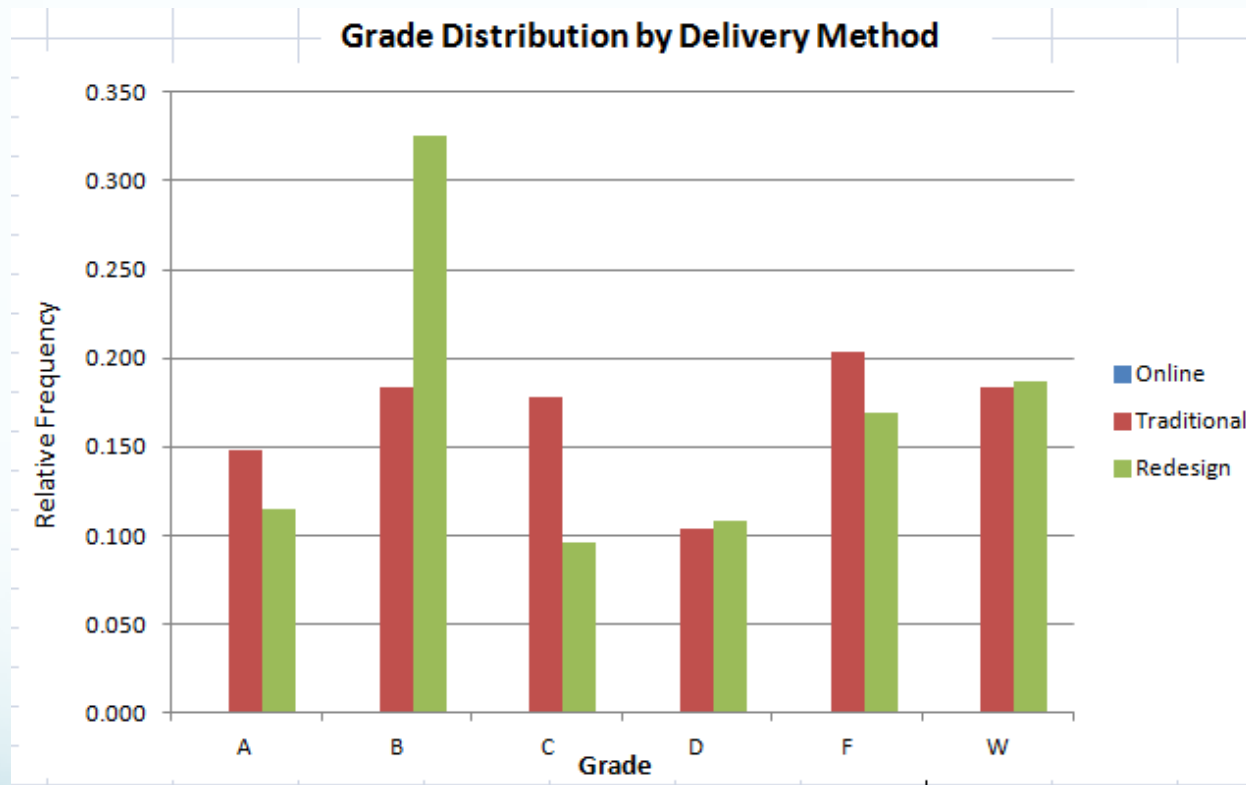


# Instructor Responsibilities

- Guide on the side
- Study skills
- Effective math/writing/communication skills
- Communication

# How Are We Doing? Data Analysis

## Math 090 – College Arithmetic



# How Are We Doing? Data Analysis

## Math 090 – College Arithmetic

Contingency Table with summary

Options

**Contingency table results:**  
 Rows: Delivery  
 Columns: Grade

Cell format  
 Count  
 Expected count

	A	B	C	D	F	W	Total
Traditional	150 145.2	186 206.2	180 168.4	105 105.7	206 201.1	186 186.4	1013
Redesign	19 23.79	54 33.79	16 27.6	18 17.32	28 32.95	31 30.55	166
Total	169	240	196	123	234	217	1179

**Chi-Square test:**

Statistic	DF	Value	P-value
Chi-square	5	21.765219	0.0006

Two sample Proportion with summary

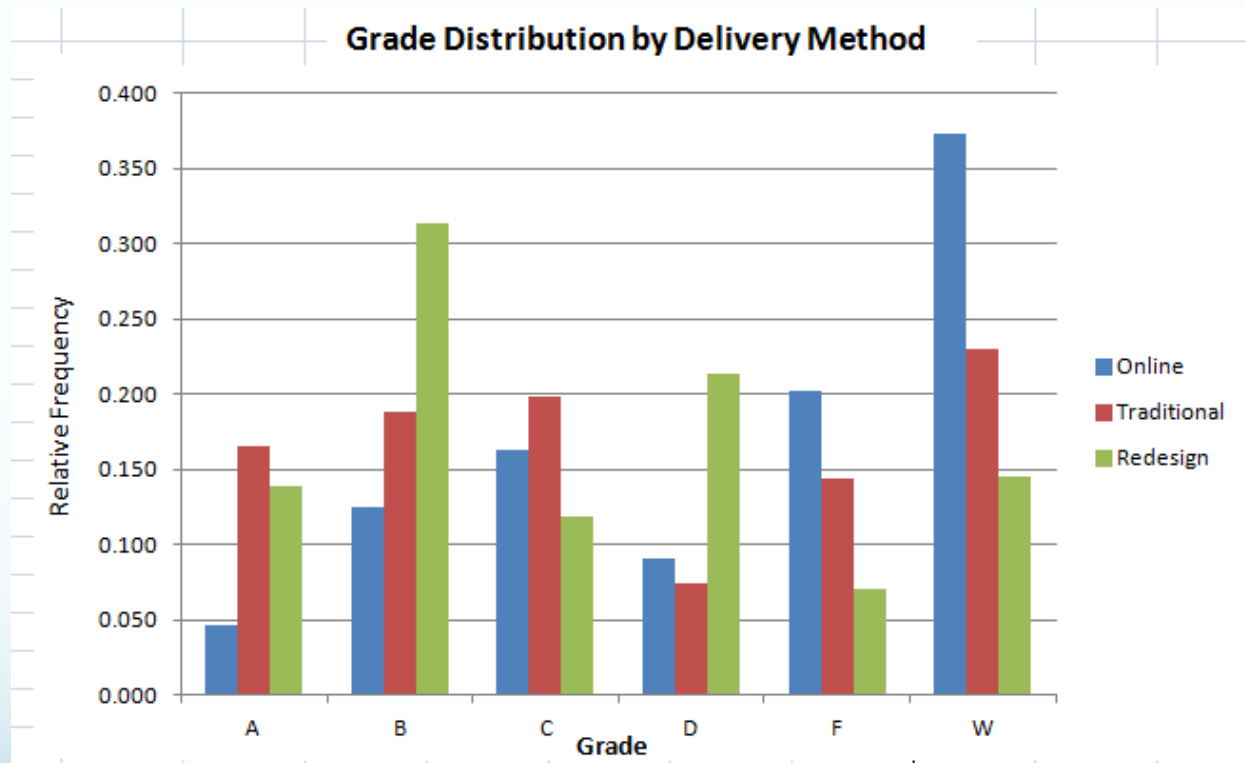
Options

**Hypothesis test results:**  
 $p_1$  : proportion of successes for population 1  
 $p_2$  : proportion of successes for population 2  
 $p_1 - p_2$  : difference in proportions  
 $H_0 : p_1 - p_2 = 0$   
 $H_A : p_1 - p_2 \neq 0$

Difference	Count1	Total1	Count2	Total2	Sample Diff.	Std. Err.	Z-Stat	P-value
$p_1 - p_2$	89	166	516	1013	0.026766494	0.04185217	0.63954854	0.5225

# How Are We Doing? Data Analysis

## Math 094 – Elementary Algebra



# How Are We Doing? Data Analysis

## Math 094 – Elementary Algebra

Contingency Table with summary

Options

**Contingency table results:**  
 Rows: Delivery  
 Columns: Grade

Cell format  
 Count  
 Expected count

	A	B	C	D	F	W	Total
Online	17 54.07	45 71.23	59 67.03	33 33.57	73 50.94	135 85.16	362
Traditional	427 385.4	486 507.7	513 477.7	190 239.2	370 363.1	594 606.9	2580
Redesign	57 61.54	129 81.07	49 76.28	88 38.2	29 57.98	60 96.92	412
Total	501	660	621	311	472	789	3354

**Chi-Square test:**

Statistic	DF	Value	P-value
Chi-square	10	225.22525	<0.0001

Traditional (Popn 2) vs. Redesign (Popn 1)

Two sample Proportion with summary

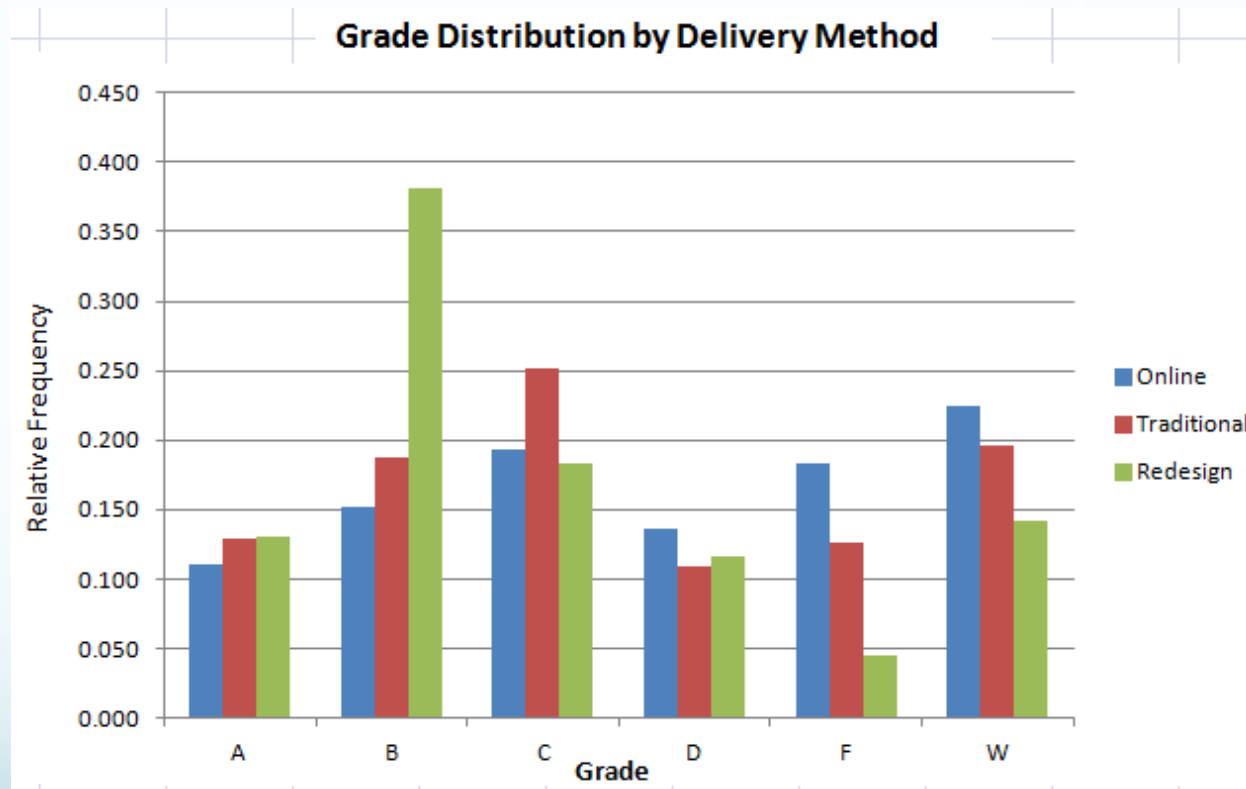
Options

**Hypothesis test results:**  
 $p_1$  : proportion of successes for population 1  
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 $p_1 - p_2$  : difference in proportions  
 $H_0 : p_1 - p_2 = 0$   
 $H_A : p_1 - p_2 \neq 0$

Difference	Count1	Total1	Count2	Total2	Sample Diff.	Std. Err.	Z-Stat	P-value
$p_1 - p_2$	235	412	1426	2580	0.01767517	0.026365414	0.67039233	0.5026

# How Are We Doing? Data Analysis

## Math 098 – Intermediate Algebra



# How Are We Doing? Data Analysis

## Math 098 – Intermediate Algebra

Contingency Table with summary

Options

**Contingency table results:**  
 Rows: Delivery  
 Columns: Grade

**Cell format**

	A	B	C	D	F	W	Total
Online	21 24.49	29 39.13	37 45.97	26 21.41	35 23.21	43 36.8	191
Traditional	270 267.3	390 427.2	526 501.8	228 233.7	262 253.3	409 401.7	2085
Redesign	35 34.23	102 54.7	49 64.26	31 29.92	12 32.44	38 51.45	267
Total	326	521	612	285	309	490	2543

**Chi-Square test:**

Statistic	DF	Value	P-value
Chi-square	10	78.85441	<0.0001

Traditional (Popn 2) vs. Redesign (Popn 1)

Two sample Proportion with summary

Options

**95% confidence interval results:**  
 $p_1$  : proportion of successes for population 1  
 $p_2$  : proportion of successes for population 2  
 $p_1 - p_2$  : difference in proportions

Difference	Count1	Total1	Count2	Total2	Sample Diff.	Std. Err.	L. Limit	U. Limit
$p_1 - p_2$	186	267	1186	2085	0.12780428	0.03015222	0.068870701	0.18690154

# Positive Student Reaction

I absolutely love that I can access any material or info that I need anywhere. The best part is I can go at my own pace.

My instructor has been a motivating influence in the class. He always made his rounds letting students know their status, making recommendations and assisting in any other way he could; we all grasp math differently.

I like the one-on-one help. In a regular class you get bombarded with material - hard to remember all that without practice.

I like hearing students in the video and that it forces me to do my homework. Material sticks.



# Negative Student Comments (sort of)

No, because I did not know the type of class this was and I was in it made me lazier since I have to work at my own pace at home. I didn't have time.

I feel it's easier to learn when personally taught and easier to ask questions that way.

# Challenges

- Fine-tuning the vision of the curriculum, structure, and implementation
- Financial Aid and registration concerns
- Customizing curricular materials and auditing for accuracy
- Seeking and educating instructors on the new pedagogy and technology