

# OER Impact Research

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Open Oregon  
Educational Resources

# OER impact research - background

- 11 peer reviewed studies on student learning
  - 48,623 students
  - 93% same or better course outcomes
- 9 peer reviewed studies on OER quality
  - 4,510 students and faculty
  - 85% perceived quality as same or better
- More OER research data:  
<http://openedgroup.org/>

# **OER Impact on Instructional Design**

Jenn Kepka

Linn-Benton Community College

Lane Community College

# What does an OER afford?

- Savings in terms of cost
- Adaptability of resources
- Currency
- Professional development

# What does an OER cost?

- Time
- Redevelopment skill (design)
- Redevelopment skill (pedagogy)
- Creating new support materials

# Findings so far:

- 20% report a primary motivation that is **not** saving students money
- One third report making substantial changes to how they teach the course after OER adoption, including changing the method of assessment and information presentation

# Future Research

- Is it the change in source material or the change in teaching method that brings better results in courses with OER?
- How can we (institutionally, individually) plan for the time and effort these changes require?



# **Outcomes in Math 105: OER vs Traditional**

Jessica Knoch  
Lane Community College

# Math 105 Research Project

## Primary Question:

Did the adoption of Open Educational Resources (OER) for Math 105 have any effect on student outcomes at Lane Community College?

## Secondary Questions:

- Did the delivery mode of the course (online versus in-person) make any difference in the effect of the OER?
- Were there any differences in the outcomes in the next math class (Math 243) between the two groups, pre-OER versus post-OER?

# Background

- In Fall 2015, Lane adopted a new textbook for all sections of Math 105: an open educational resource (OER) titled “**Math in Society**,” by David Lippman.
- Although the textbook is “open,” and we had the ability to edit it, we took the textbook “as is” for the first two years.
- Course leadership, topics, and philosophy remained largely unchanged during the four year period under consideration, from Fall 2013 to Spring 2017. Instructor pool did see changes.

# Methods

We looked at 19 sections during the 2013-14 and 2014-15 school years (Pre-OER) and 22 sections during the 2015-16 and 2016-17 school years (not including Spring 2017) and considered:

- **completion** (achieved a grade),
- **average grade** amongst completers, and
- **success rate** (passing versus not passing)

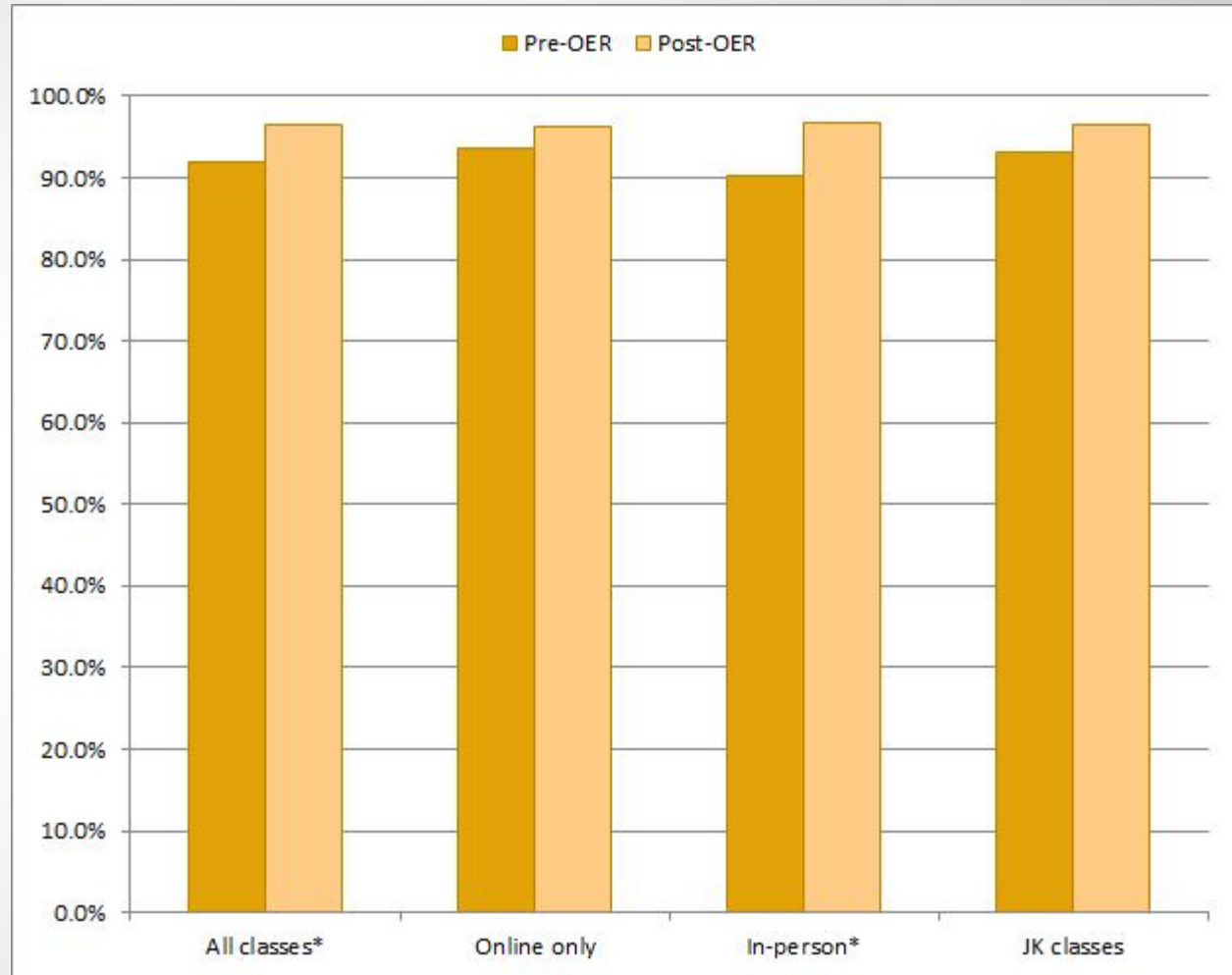
We also compared classes that were:

- Online only (10 Pre-OER, 6 Post-OER) and In-Person Only
- Same instructor (JK): 5 Pre-OER and 5 Post-OER

# Results:

## Completion Rate

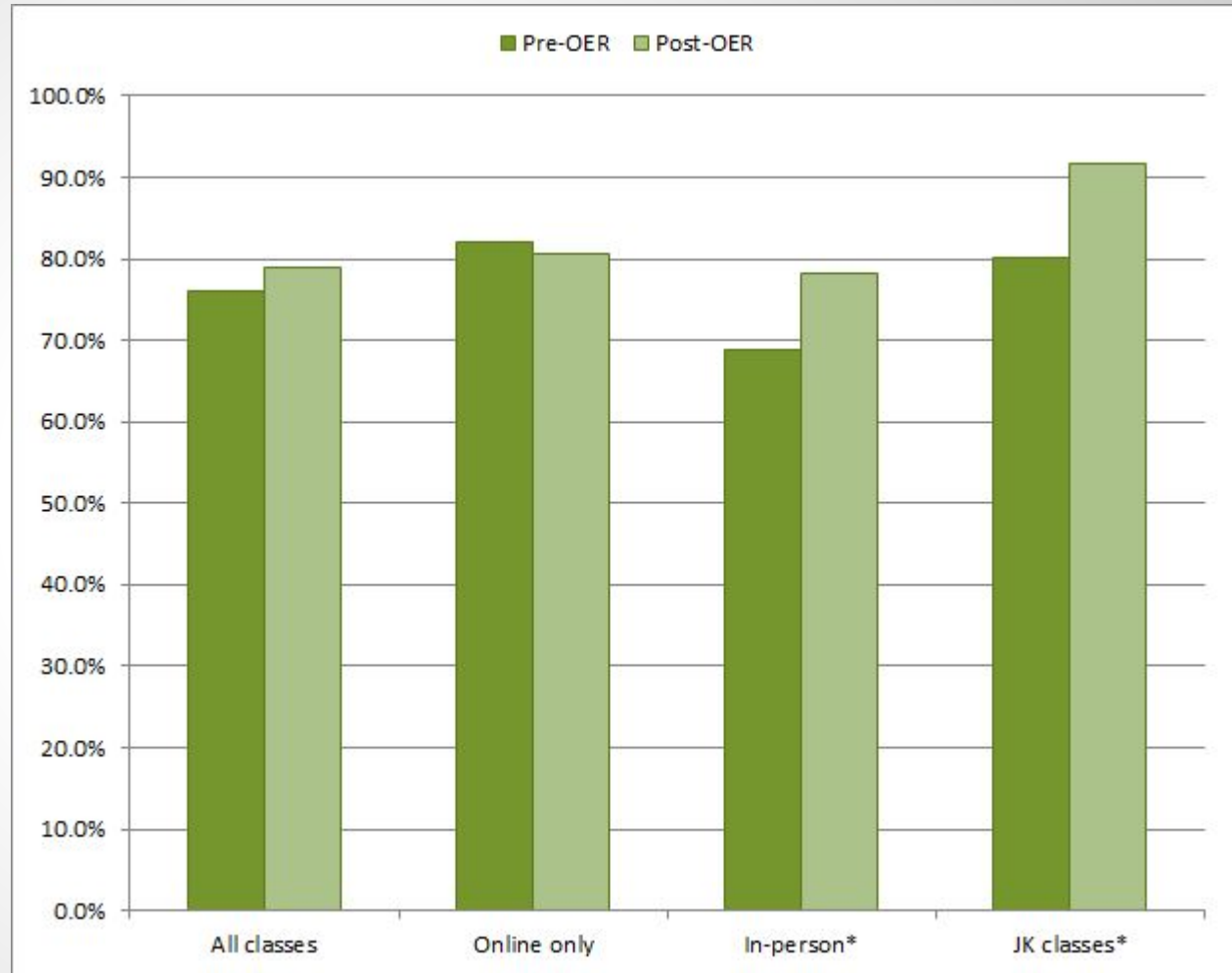
(P, NP, or any grade, out of N)



# Results:

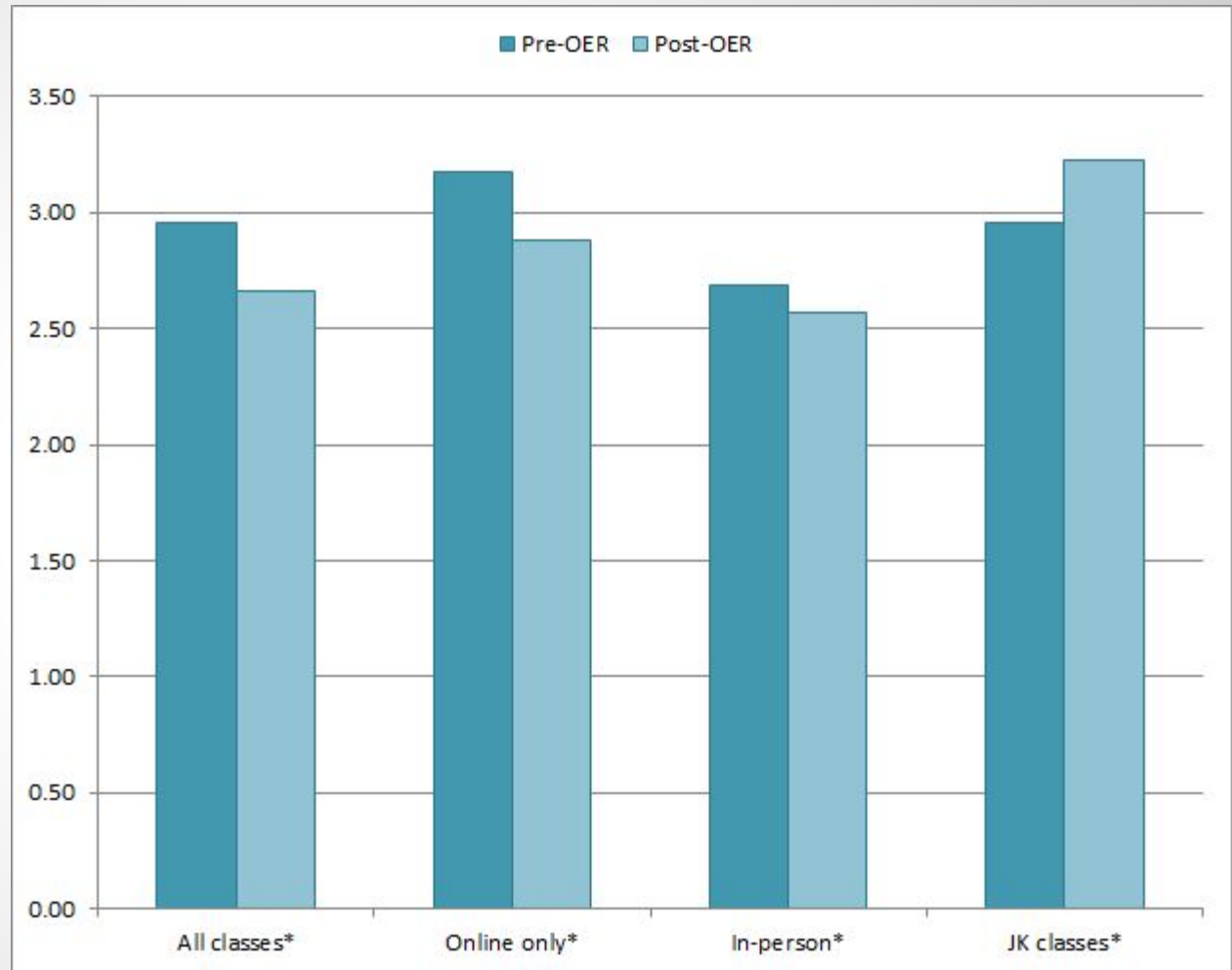
## Success Rate

(Pass, or C- or better, out of N)



# Results:

Average  
Grade



# Cautions

- Math 98 started Fall 2014
  - Students from Math 98 compared to students from Math 95
  - Decline in average grade and success rate expected
- No attempt was made to control for instructors
  - Yes, “some” overlap between the teaching groups, *but...*
  - Several Post-OER instructors were teaching Math 105 for the first time.
  - Some Pre-OER instructors had unusually high success rates.



# Future Research Directions

- Confounding instructors: do instructors who choose courses with OERs tend to be more energetic/attentive? Or are they less senior / less experienced on average?
- Compare the outcomes in a subsequent math course (Math 243)
  - Caution: Most 105 students don't go on to Math 243
  - Further caution: Math 243 moved to an OER in Fall of 2016
- Persistence: are students who used OER for Math 105 more likely to graduate, or earn a certificate, than students who did not?

# **Course Completion & Pass Rates**

Jennifer Lantrip  
Umpqua Community College

# Research Project

## Background

Since the Fall of 2015, several faculty across disciplines at UCC have replaced their commercial textbooks with OER textbooks.

## Research Question

How have Course Throughput Rates (the combined effect of drop rates, withdraw rates, and final grades) changed after faculty adopted an OER textbook?

# Methods

Gathered data for 16 courses from a variety of disciplines which had previously used a commercial textbook and which adopted an OER textbook between Fall 2015 and Summer 2016.

In 14 of these courses, the OER textbook was adopted at the same time by all faculty teaching the course.

The remaining two courses each had multiple sections. The OER textbook was adopted at the same time by two or more faculty who taught the courses, while the other faculty teaching the course continued to use the commercial textbook. For these two courses, data was only gathered for the courses taught by faculty who made the change to an OER textbook.

# Methods

Terms OER Textbooks Adopted									
Blue = Commercial Textbook					Yellow = OER Textbook				
Fa 14	Wi 15	Sp 15	Su 15	Fa 15	Wi 16	Sp 16	Su 16	Fa 16	Wi 17
				Fall 2015: 7 courses					
					Winter 2016: 2 courses				
						Spring 2016: 2 courses			
							Summer 2016: 5 courses		

# Methods

Data was gathered for each section of each course from Fall 2014 - Winter 2017.

- Enrolled: Number of students enrolled at the beginning of the term.
- Drops: Number of students who dropped during weeks 1-4.
- Withdraws: Number of students who withdrew from the course after week 4.
- Passing grades: Number of students who received an A, B, or C grade.

# Results: Drops Weeks 1-4

Null hypothesis: There is no difference between the means of the percentage of drops during Weeks 1-4 for courses before and after adopting an OER.

Performed a two sample z-test for the null hypothesis.

	<b>Commercial</b>	<b>OER</b>
<b>Total Enrollment</b>	1024	940
<b>Mean % Drops</b>	4.6%	4.04%

**Z = -1.789**  
**p = 0.074**

# Results: Withdraws After Week 4

Null hypothesis: There is no difference between the means of the percentage of withdraws after Week 4 for courses before and after adopting an OER.

Performed a two sample z-test for the null hypothesis.

	<b>Commercial</b>	<b>OER</b>
<b>Total Enrollment - Total Drops Weeks 1-4</b>	976	904
<b>Mean % Withdraws</b>	5.76%	10.32%

**Z = 8.171**  
**p < 0.0001**



# Results: Passing Grades

Null hypothesis: There is no difference between the means of the percentage of students with A, B, and C grades for courses before and after adopting an OER.

Performed a two sample z-test for the null hypothesis.

	<b>Commercial</b>	<b>OER</b>
<b>Total Enrollment - Total Drops Weeks 1-4 - Total Withdraws After Week 4</b>	920	845
<b>Mean % Passing Grades</b>	90.96%	86.51%

**Z = -6.727**  
**p < 0.0001**

# Results: Course Throughput Rates

Null hypothesis: There is no difference between the means of the percentage of students who complete and earn A, B, and C grades for courses before and after adopting an OER.

Performed a two sample z-test for the null hypothesis.

	<b>Commercial</b>	<b>OER</b>
<b>Total Enrollment</b>	1024	940
<b>Mean % Passing Grades</b>	82.14%	75.39%

**Z = -7.7**  
**p < 0.0001**

# Future Research Directions

- How does the difference in terms affect the data?
- Many of the textbook changes happened during the 2015-16 academic year. Did this unusual academic year have an impact on the data?
- How do these rates compare to the rates of the rest of the courses at UCC during these same terms?
- How accurate is the adoption data? The dates OER textbooks were adopted and used were collected from individual faculty members. Is it possible that some of these adoption dates were incorrect?

# Future Research Directions

- How does the course throughput rate compare for OER and commercial sections of the same course taught during the same term?
- How does using an OER affect the persistence rate from term to term?
- Are there certain courses which had better course throughput rates than others before and after the change to OER?
- What are student and faculty perceptions of OER for these courses?
- Does the format of the OER textbook have an impact on the CTR? E.g., those which are available only online vs. those with a low cost print version available at the bookstore?

**GO-Open**



John Schoppert  
Columbia Gorge Community College

# CGCC OER Research Project

## Primary Question:

What has been the measurable cost impact of OER courses at CGCC?


## Secondary Questions:

- What has been the impact of student enrollment with OER courses indicated with the GO-Open icon?
- What has been the impact of student outcomes with OER courses indicated with the GO-Open icon?

# Schedule Icon introduced winter '14

## Credit Classes



### HPE 295 Health & Fitness for Life 3 cr.

 ONLINE COURSE. Explores the interrelationship of the five components of physical fitness, basic nutrition concepts, and stress management activities to increase individual health and wellness. Includes lab sessions, fitness assessments, and fitness program development. Audit available. Moodle fee: \$50


**1091260** 11 wks Hughes  
ONLINE info on page 9

### HISTORY

### HST 103 Western Civilization: Modern Europe 4 cr.

  ONLINE COURSE. Studies history of 19th and 20th century Europe, including the Industrial Revolution, nationalism, imperialism, socialism, the Russian Revolution, Nazism, world wars and their aftermath. Prerequisites: MTH 20 or equivalent placement test scores.


### MTH 60 Beginning Algebra I 4 cr.

 Covers the use of applications, formulas, and reasoning skills to write, manipulate, interpret, solve and graph linear equations and systems. Introduces concepts numerically, graphically, and symbolically. Develops skills to communicate results in oral and written form. Prerequisites: MTH 20 or equivalent placement test scores.


**The Dalles**  
**1091265** 11 wks Byers  
TDC 1.354 Tu Th 10:00am-12:20pm

**Hood River**  
**1091266** 11 wks Morse  
HRC 310 M W 1:00-3:20pm

### MTH 65 Beginning Algebra II 4 cr.

 Covers the use of applications, formulas, and reasoning skills to write, manipulate, interpret, and solve equations involving polynomials, radicals, and rational

### MTH 112 Elementary Functions 5 cr.

 Investigates periodic functions, trigonometric identities, vectors, polar coordinates, parametric equations, complex numbers and applications. Graphing calculator required. Prerequisite: MTH 111 or equivalent placement test scores. Prerequisite/concurrent: WR 121. Audit available.

**1091273** 11 wks Evans  
TDC 1.333 M W 10:00am-12:20pm

### MTH 243 Statistics I 5 cr.


Introduces displaying data with graphs, numerical descriptions of data, producing data, elementary probability, probability distributions, confidence intervals and significance testing. Investigates applications from science, business, and social science perspectives. Graphing calculator required. Prerequisite: MTH 95. Prerequisite/concurrent: WR 121. Audit available.

**1091274** 11 wks Wolman

# GO-Open, LOW-GO, distinctions

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# *GO-Open, LOW-GO, distinctions*



Gorge Open

This icon signifies courses using alternative textbooks and resources instead of new editions of publisher textbooks. These instructors either develop original materials or access freely available resources. This helps decrease the burden of textbooks costs to students and provides an engaging learning experience.



Low-Go

This icon signifies courses using used or low cost textbooks under \$50.00. These instructors use low cost books and resources to decrease the burden of textbooks costs to students while still providing an engaging learning experience.

# Cost Impact of OER courses

- 62 faculty have adopted OER
- 140 OER courses created
- 4,559 students

**Textbook costs savings = \$469,196.87**

# CGCC OER Research Project

## Secondary Questions:

- What has been the impact of student enrollment with OER courses indicated with the GO-Open icon?
- What has been the impact of student outcomes with OER courses indicated with the GO-Open icon?

# Results:

Enrollment number:

OER = 577

Text = 373

Withdraw number:

OER = 43

Text = 23

Withdraw rates:

OER = 13%

Text = 16%

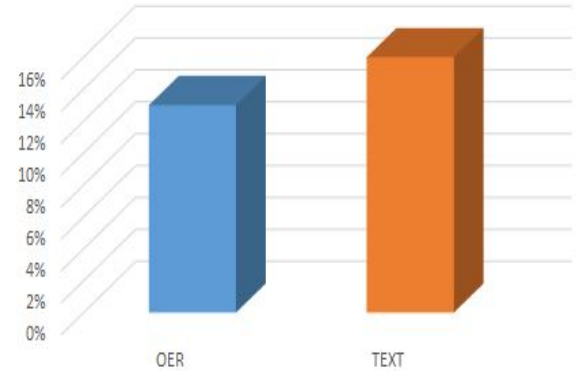
Total Enrollment



Total Withdraws



Withdraw rate



# Results:

Student outcomes

C grade or better:

OER = 444

Text = 293

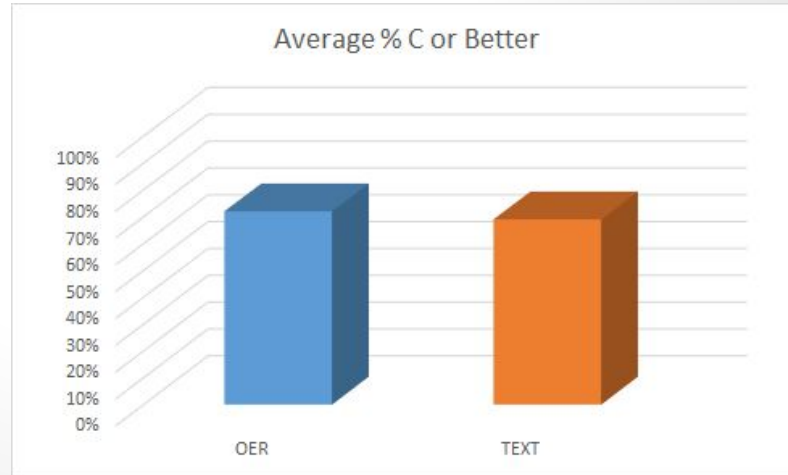


Student outcomes

percentage C or better:

OER = 72%

Text = 69%



# **Psychology 201A & 202A**

Dr. Zip Krummel

Columbia Gorge Community College

# Psychology 201A & 202A

## Primary question:

How do student outcomes and perceptions differ between traditional textbook resources and OER?

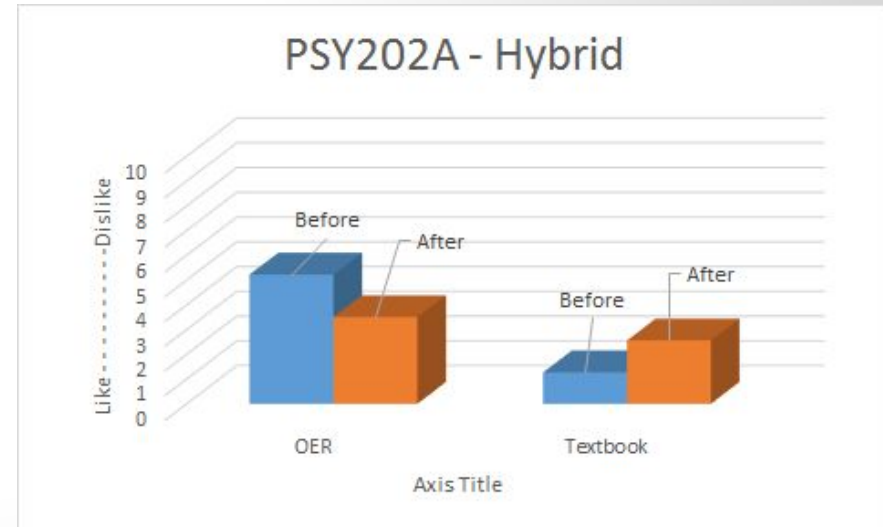
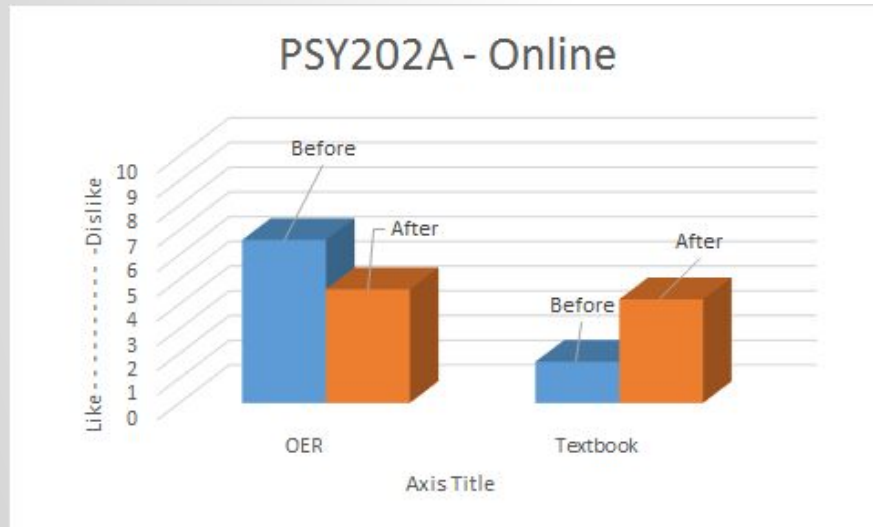
- Dr. Zip Krummel, CGCC psychology instructor
- Split two Psychology course sections -
  - PSY201A (Hybrid)
  - PSY202A (Online)
- 1/2 class used instructor developed OER, other 1/2 of class used publisher's textbook

# Background

- CGCC psychology instructors early adopters of OER
- Kristen Kane developed PSY 201A & 202A previously using OpenStax Psychology



# Before & After perceptions of materials



# Pre-class student comments

- “I was excited. I am older than the technological age.” (202A, online, textbook)
- “Disappointed I had to buy a book, but happy because I learn better through a book.” (202A, online, textbook)
- “I like the versatility, but I don’t like having to rely on an internet connection to view the text.” (202A, online, OER)

# Post-class student comments

- “I feel like I understand the material better if I had a physical copy of it.” (201A, hybrid, textbook)
- “I was apprehensive about OER at first but since the information is so readily accessible . . .” (201A, hybrid, OER)
- “I enjoyed using the OER text. There weren’t many times I missed using the textbook.” (202A, online, OER)