Results of a Successful Redesign of an Introductory Statistics Course: Improved Student Performance, Retention, and Course Satisfaction

Nimet Alpay
Franklin University, nimet.alpay@franklin.edu

Natalya Koehler
Franklin University, natalya.koehler@franklin.edu

Carolyn LeVally
Franklin University

Nimet Alpay, Ph.D.
Natalya Koehler, Ph.D.
Carolyn LeVally
Franklin University

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2015 - 2016

Major Goals of Redesign

To increase:

- Student Retention
- Performance
- Graduation Rates
- Instructional Support for Online Learners
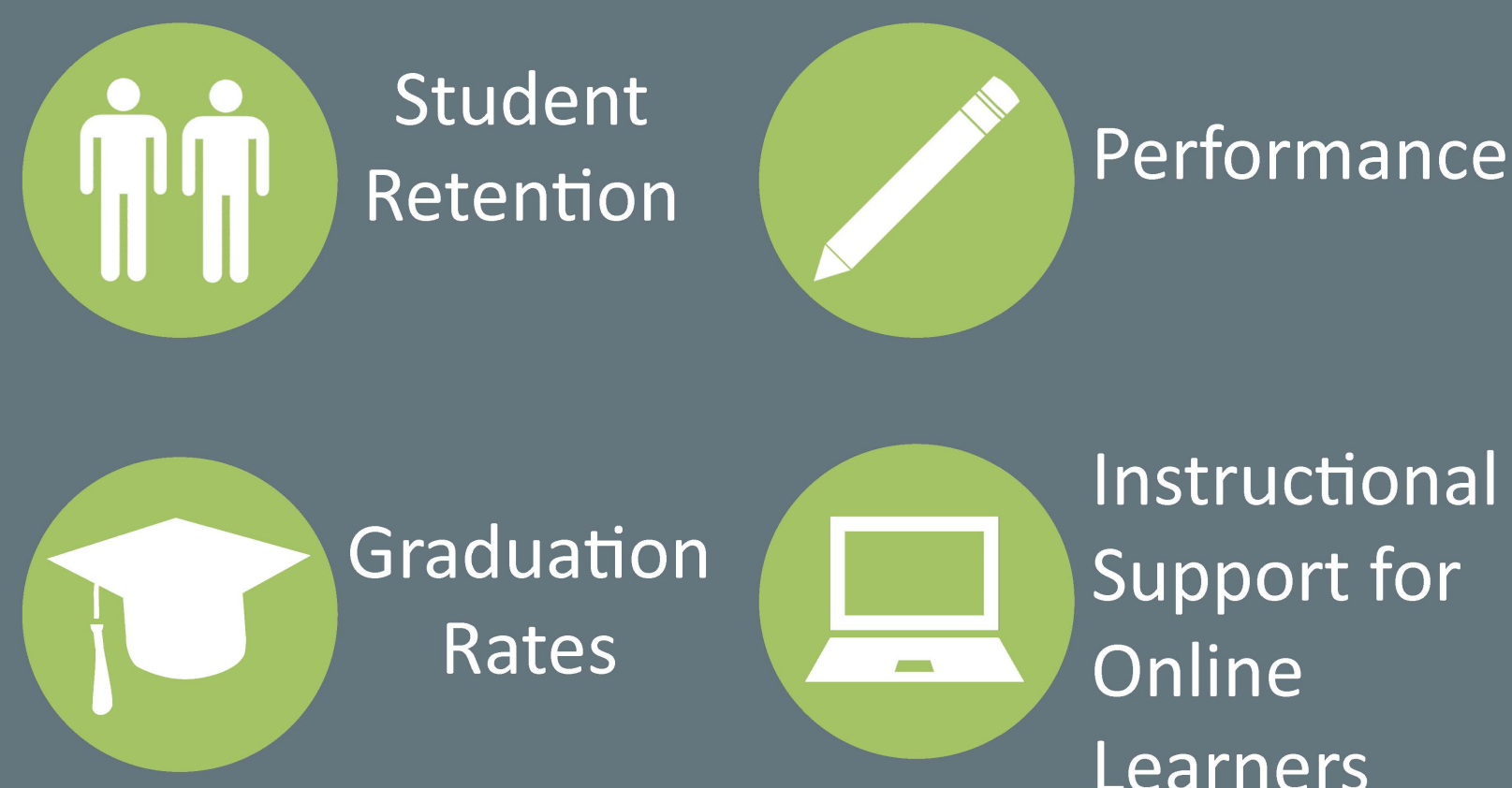
Data-Driven Course Redesign

The course redesign was based on:

- Student course evaluation surveys
- Instructor interviews
- Program & department chair interviews
- Student use of optional academic support services
- Data about student performance and attrition

Factors Impacting Retention

Factors that impact student retention are:

- Effective Instruction
- Effective Course Design

Redesign Elements

The course redesign included the following elements:

- Textbook change
- Web-based component change
- Weekly assignment & assessment types
- Systematic instruction through interactive multimedia lectures

Redesign Elements Continued

Textbook Change

The **old textbook** has consistently been an extremely confusing, difficult-to-follow textbook for part-time, non-traditional students.

The **new textbook** has received a welcome reception. Students comment that the textbook is easy to understand and it breaks down statistic concepts in clear, concise manner.

Web-based Component Change

We added the following web-based components to the course:

Smartbook: Adaptive learning technology

ConnectMath: Assignment & assessment platform with integrated media-rich ebook.

Weekly Assignment & Assessment Types

We designed the following types of assignments & assessments:

- **Interactive Lectures**: Provides support for learning the most difficult statistical facts and concepts
- **ConnectMath assignments**: Used for learning facts, concepts, and practicing statistical procedures
- **Group assignments**: Used to practice statistical concepts and procedures in a group setting
- **Application assignments**: Provides students with practical applications of statistical concepts and procedures

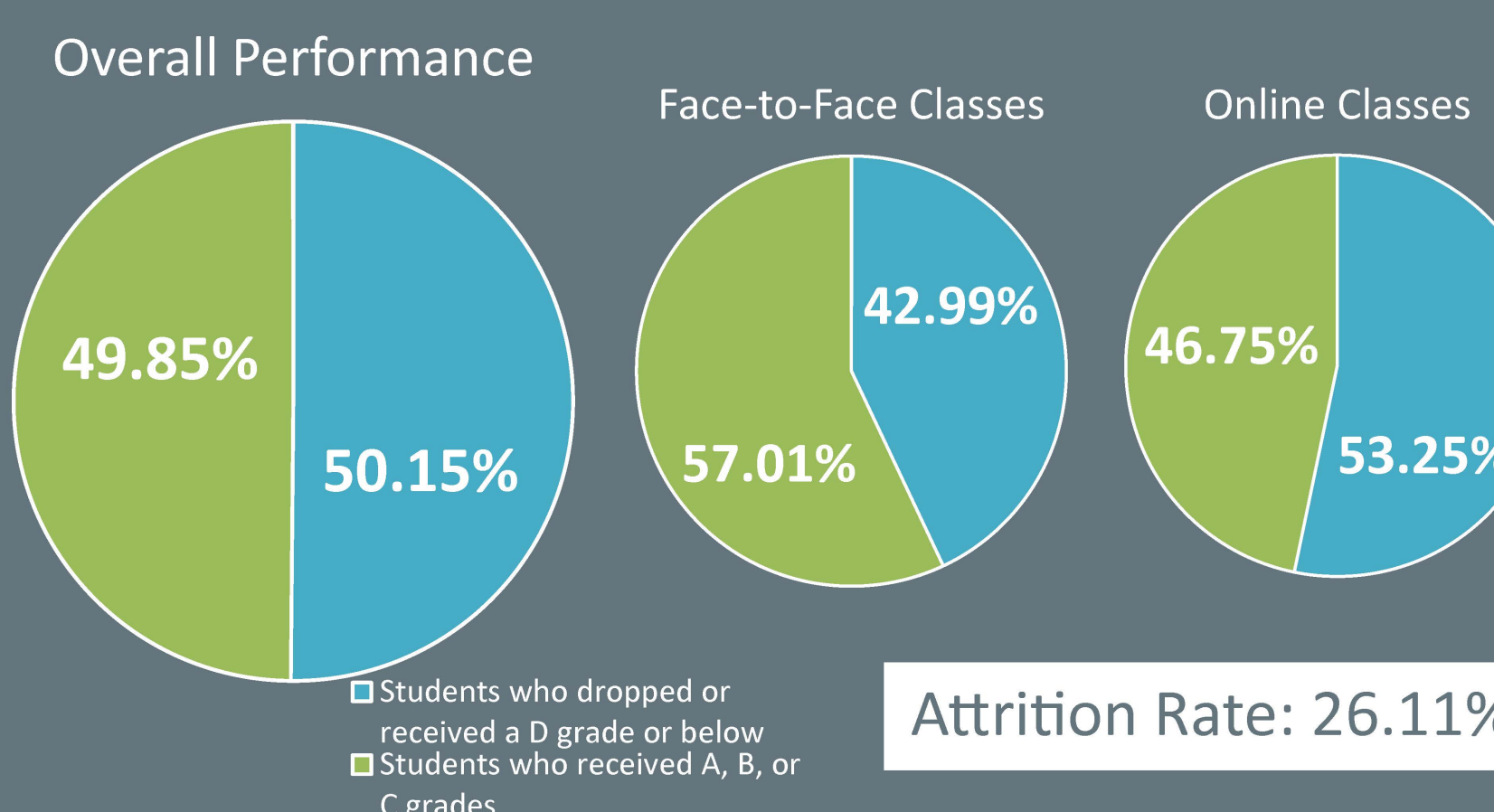### Interactive Multimedia Lectures

We developed 28 multimedia lectures to help students understand difficult statistical concepts. Each lecture includes:

- **New information delivery**
- **Information summary**
- **Comprehension questions**: Multiple choice, drag & drop, fill in the blank, etc.
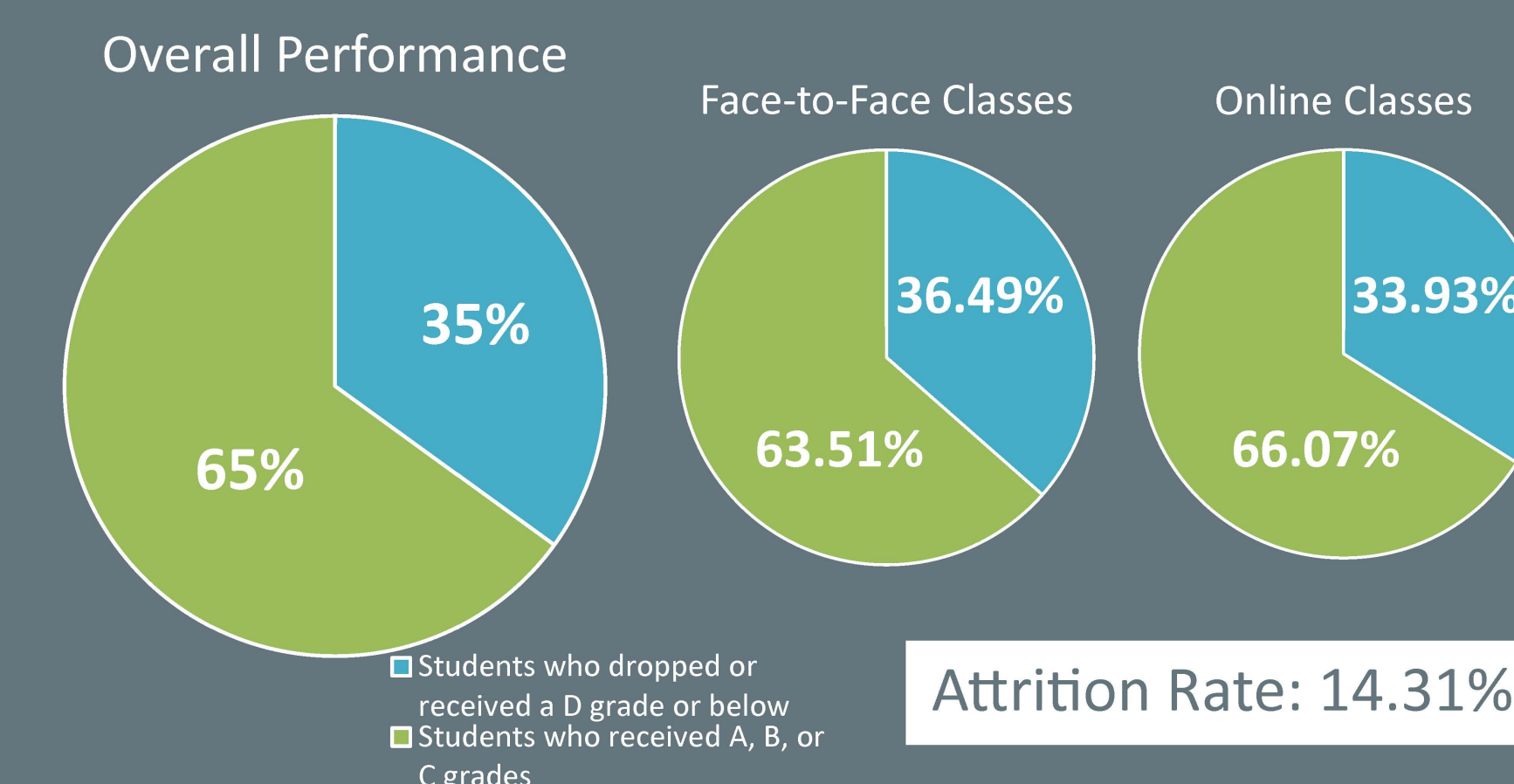
The Results

Fall 2013 - Prior to Course Redesign

Student Performance & Attrition

Overall Performance
49.85% / 50.15%

Face-to-Face Classes
57.01% / 42.99%

Online Classes
46.75% / 53.25%

☐ Students who dropped or received a D grade or below
☐ Students who received A, B, or C grades

Attrition Rate: 26.11%

Fall 2014 - After Course Redesign

Student Performance & Attrition

Overall Performance
65% / 35%

Face-to-Face Classes
63.51% / 36.49%

Online Classes
66.07% / 33.93%

☐ Students who dropped or received a D grade or below
☐ Students who received A, B, or C grades

Attrition Rate: 14.31%

Continuing Redesign Effects

	FALL 13	FALL 14	WINTER 15	SUMMER 15	FALL 15	WINTER 16
Total # of Students	335	255	279	147	236	209
Online Students	221 (66%)	127 (50%)	170 (61%)	83 (56%)	147 (62%)	131 (62.7%)
FF Students	114 (34%)	128 (50%)	109 (39%)	65 (44%)	89 (38%)	78 (37.3%)
Grade A	12.2%	21.2%	19.4%	20%	23%	25.4%
Grades: A – C	49.8%	64.3%	66.7%	68%	66%	67.5%
Grades: DEWZ	50.2%	35.6%	31.4%	32%	33%	32.5%
Attrition Rates	26.11%	14.31%	11%	13%	17%	12.9%

Course Recommendation Rates

	Fall 13	Winter 14	Summer 14	Fall 14	Winter 15	Summer 15	Fall 15
% Course Recommend	55.8%	57.3%	53%	71%	69%	71%	77%
% Faculty Course Recommend	82%	88%	76%	88%	85%	92%	88%

Student Comments

Many students have positively commented on the new course design. Below is just one representative comment:

"I have truly enjoyed myself in this course! Everyone at work was instilling fear in me that 'stats will be the hardest class you take' and you just need to get through it. But, after that first class meeting, I thought 'I don't think this is going to be that bad. The professor really has it together.' And, I found the subject super interesting. So much, in fact, that I spoke to one of the epidemiologists last week. She told me that once I graduate, I can go to a weekend class for certification in epidemiology. And, if she is still the manager of the department, she would hire me! It's good to have options. So, thank you so much for opening up new possibilities for me, the girl that hated math and word problems. Haha!"

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