Increasing Active Learning in an Online Introductory Statistics Course with Low-Stakes Assignments

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Objectives

1. Define active learning
2. Review active learning research
3. Demonstrate how low-stakes assignments can be used to promote active learning in an online course

Define Active Learning

Instructional activities that encourage or require students to cognitively interact with content

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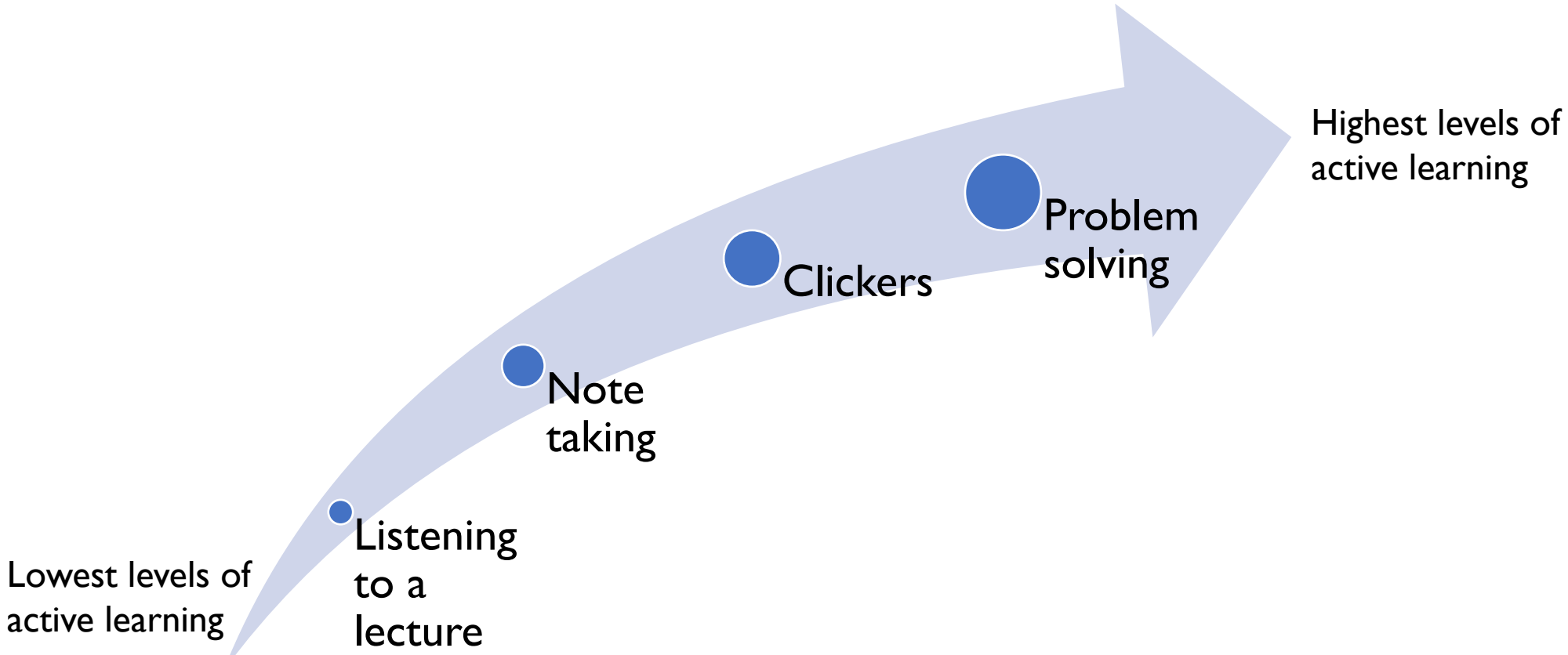


Research

Active learning increases exam scores

Meta-analysis of 225 studies, average effect size of d = 0.47 [z = 9.781, p<.001; Freeman, et al. (2014)]

Course completion rates improve with active learning

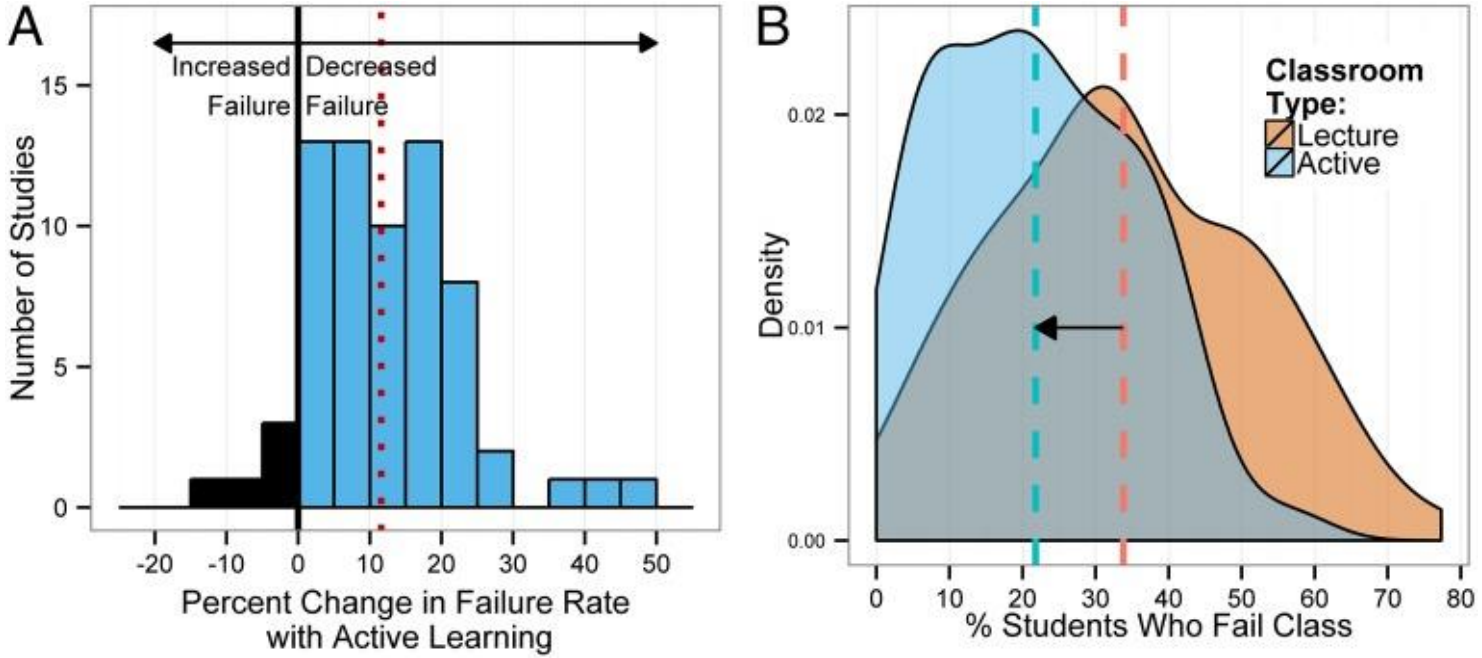


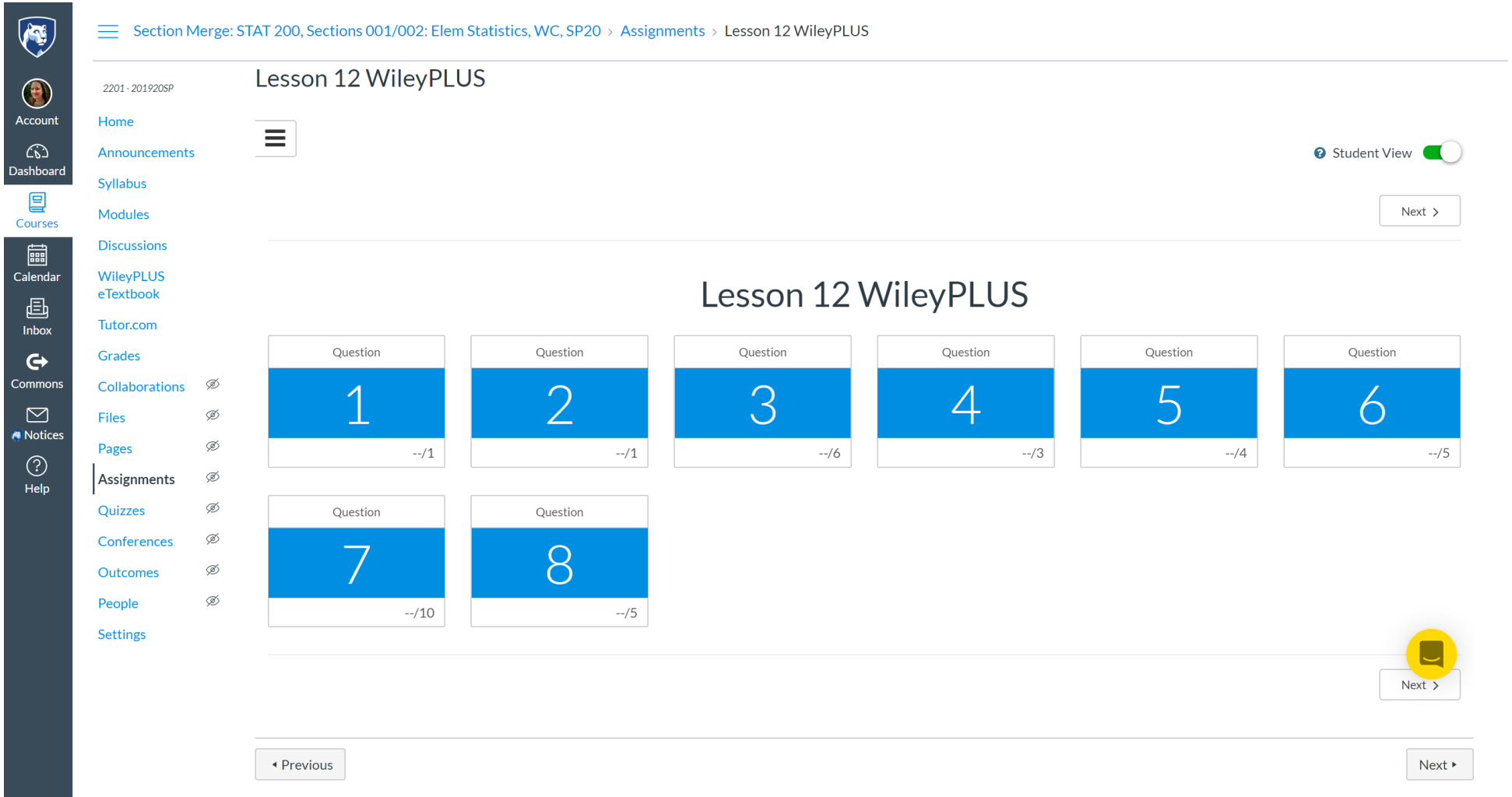
Fig. 1 from Freeman, et al. (2014)

Research

Active learning can have a positive impact on students' attitudes

- More favorable feelings about statistics and greater confidence (Carlson & Winquist, 2011)

Active Learning Through Low-Stakes Assignments



Question 3

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View Policies

Current Attempt in Progress

Two variables are defined, a regression equation is given, and one data point is given.

Study = number of hours spent studying for an exam
Grade = grade on the exam
$\hat{Grade} = 41.4 + 3.9(Study)$

The data point is a student who studied 10 hours and received an 81 on the exam.

(a) Find the predicted value for the data point and compute the residual.

Enter the exact answers.

Predicted value =

Residual =

eTextbook and Media

Hint

(b) Interpret the slope in context.

- Given a one hour increase in study time, expected change in *Grade* is 3.9 .
- Given a one point increase in *Grade*, expected change in *Study* time is 3.9 hours.
- Given a one hour increase in study time, expected grade will be 3.9 .

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Final Exam Practice Quiz (Required)

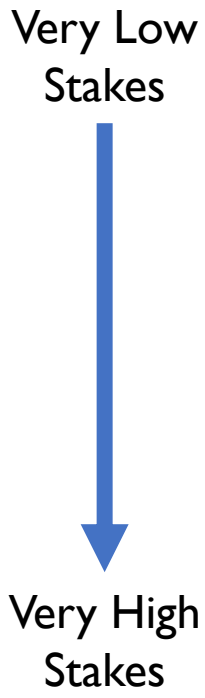
Quiz Type	Graded Quiz
Points	15
Assignment Group	Quizzes
Shuffle Answers	No
Time Limit	30 Minutes
Multiple Attempts	Yes
Score to Keep	Highest
Attempts	Unlimited
View Responses	Always
Show Correct Answers	Until May 5 at 12am
One Question at a Time	Yes
Lock Questions After Answering	No

Due	For	Available from	Until
May 5	Everyone	-	May 5 at 11:59pm

Preview

Grade Breakdown

Group	Group Weight	Number of Assignments	Weight per Assignment	Number of Attempts
WileyPLUS	15%	12	1.25%	Unlimited
Quizzes	15%	12 Lesson Quizzes 3 Exam Practice Quizzes	1%	Lesson Quizzes = 2 Exam Practice Quizzes = Unlimited
Lab Assignments	20%	12	1.667%	One
Midterm Exams	30%	2	15%	One
Final Exam	20%	1	20%	One



References

Carlson, K. A., & Winquist J. R. (2011). Evaluating an active learning approach to teaching introductory statistics: A classroom workbook approach. *Journal of Statistics Education, 19*(1). DOI: 10.1080/10691898.2011.11889596

Freeman, S., Eddy, S. L., McDonough, M., Smith, M., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proc Natl Acad Sci USA, 111*(23), 8410-8415. DOI: 10.1073/pnas.1319030111