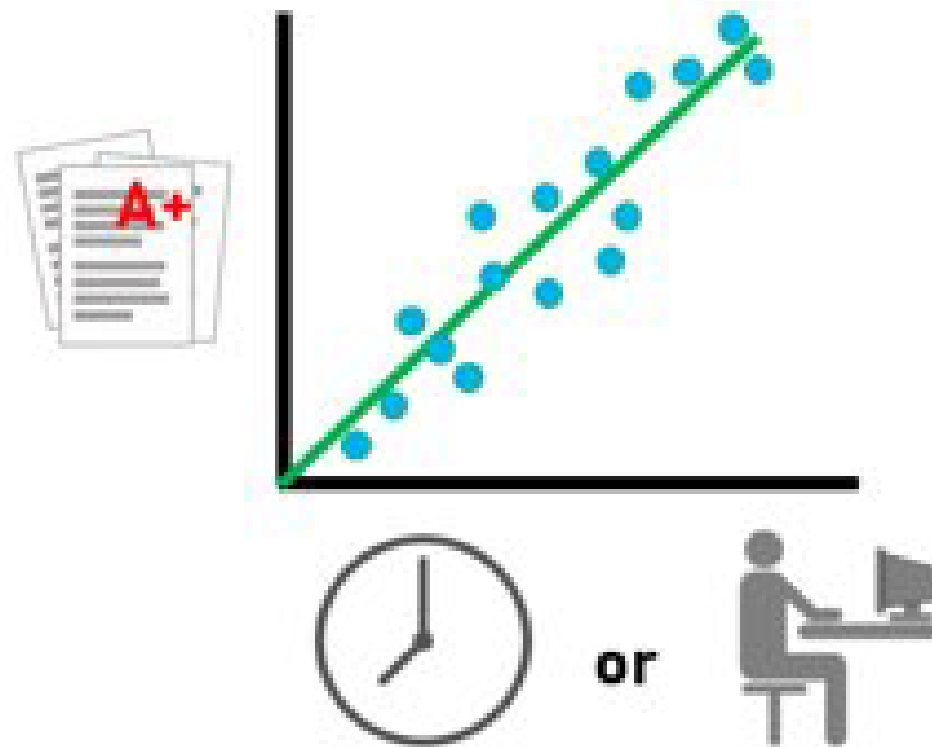




# Is time in the course or page views correlated with performance?

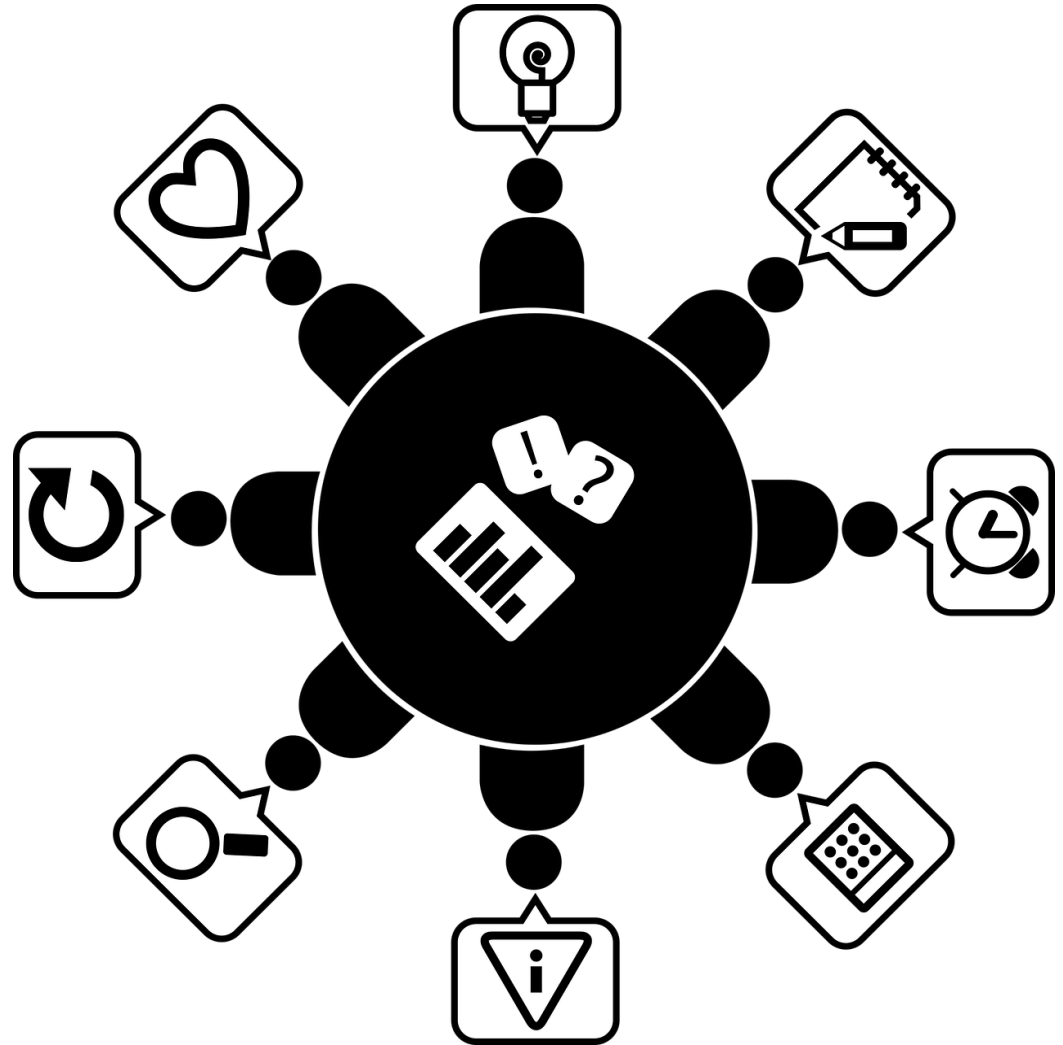
John Griffith & Emily Faulconer

Embry-Riddle Aeronautical University



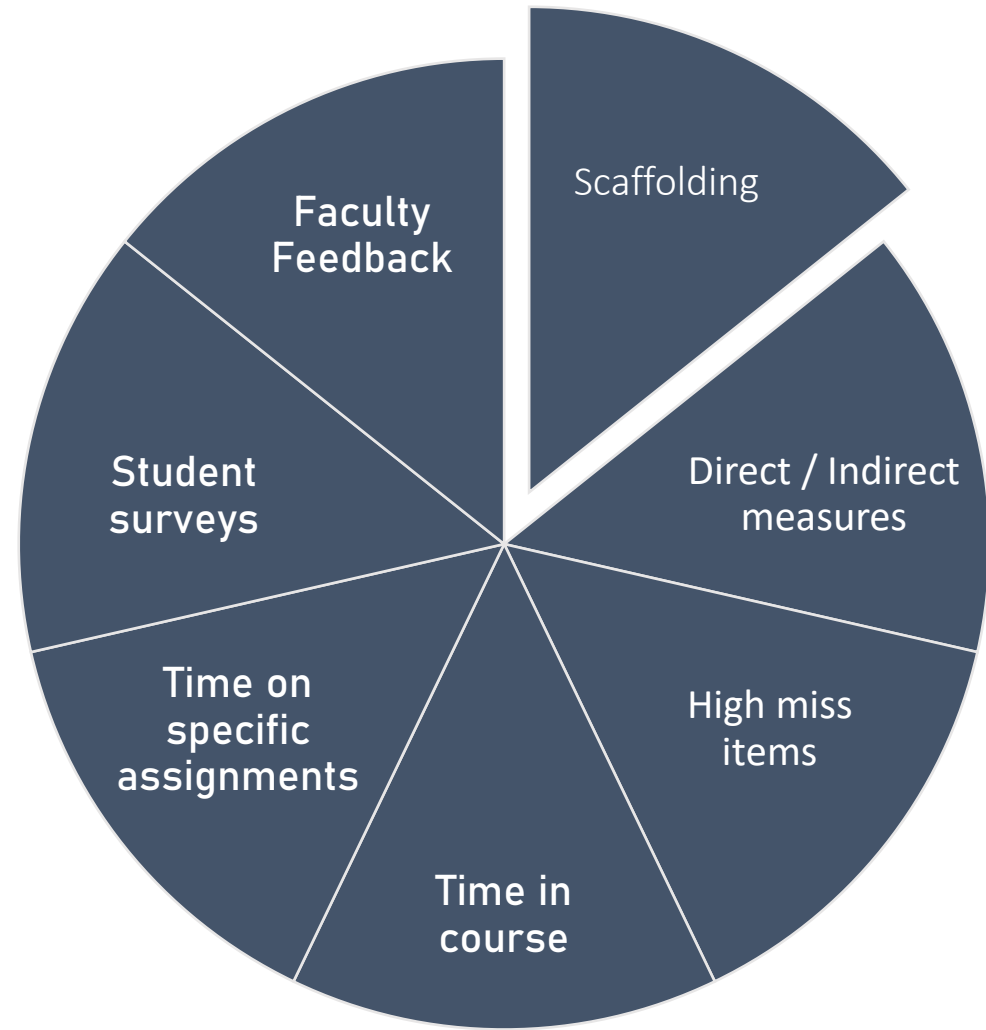


# How can you tell if an online course is effective?



# Best Practice:

# Assessment





**Active learning engages students in the learning process.**

Low-stakes homework can be designed to be active learning

Active learning can improve assessment performance for STEM students

Best practices:

- Strong instructor presence for active learning tasks
- Promote active learning by allowing application of formative feedback
- Strong rubric design to emphasize expectations for active learning



**Scaffolding moves students through progressively stronger understanding of the content**

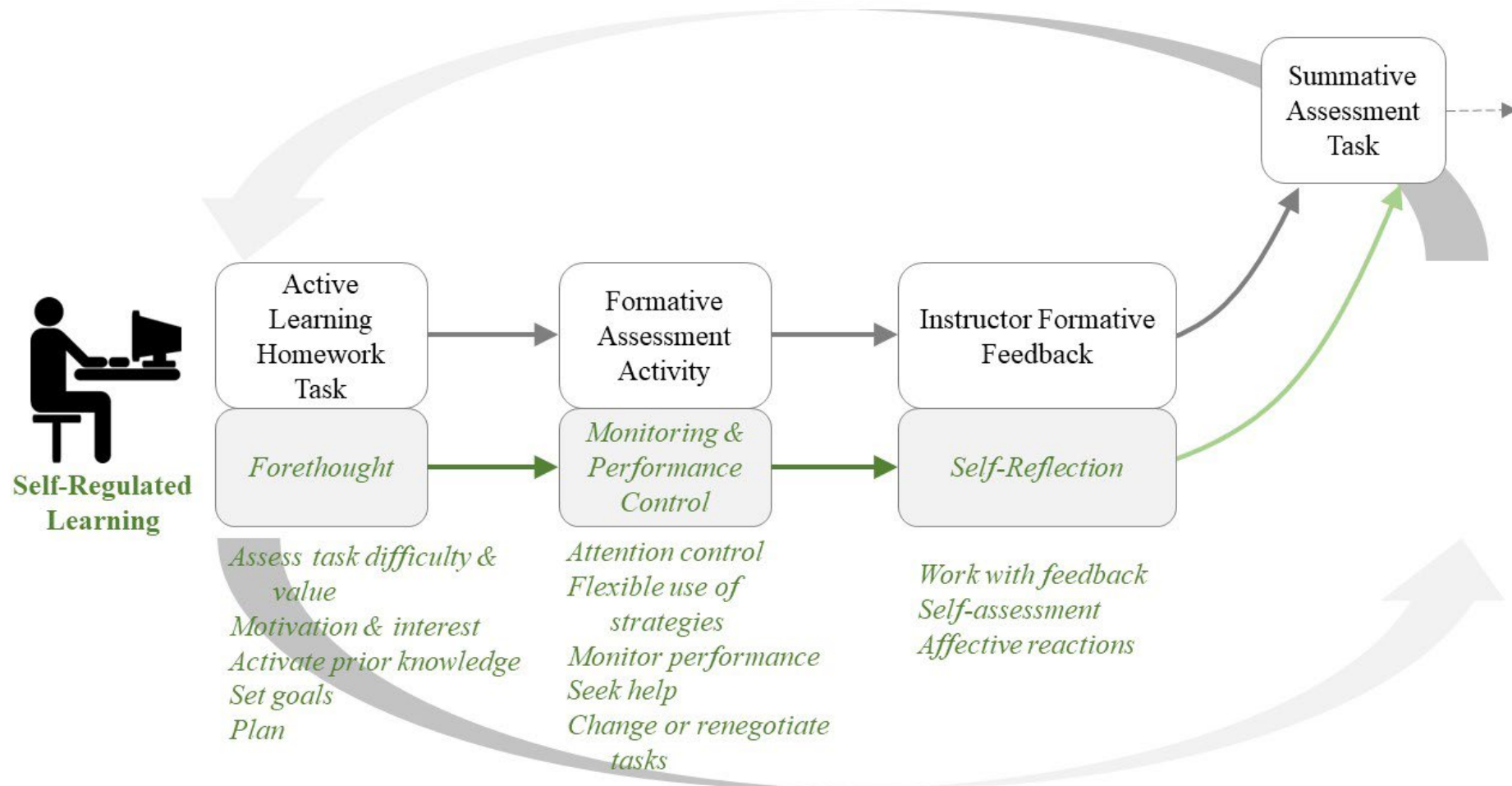
Low-stakes formative assessment is an example of scaffolding

Scaffolding helps students build self-regulated learning skills

Best practices:

- Use workload estimates
- Communicate expected workload
- Design with desired SRL behaviors in mind

# Students engage with scaffolded learning activities that promote active, self-regulated learning.





**Before you taste, better check the ingredients .....**





# Is scaffolding effective?

Impact on course grades and key assignments



Homework, Quizzes,  
Mid Term Exams



Discussions and  
Assignments





# Course and demographics



## Online – 200 level

- 9-week terms
- $\approx$  2,500 per year
- Three course sections over 2 nine-week terms, same instructor (n=85)

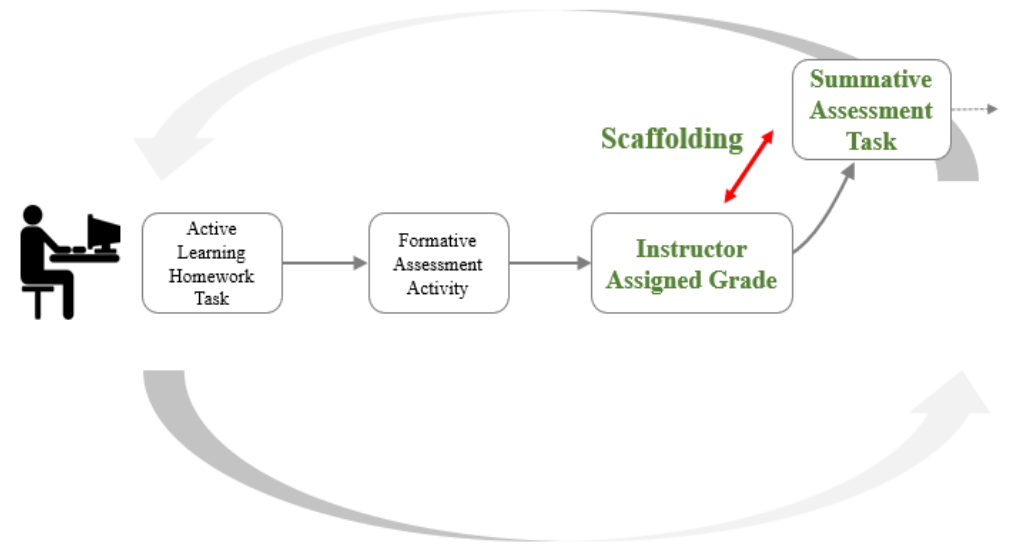
## Students

- Working adults
- $\approx$  34 years old
- $\approx$  50% Military enlisted
- $\approx$  30% military affiliated
  - Spouses
  - GI Bill
- 7 Female (M =93.5, SD=4.6)
- 78 Male (M=83.3, SD=21.3),  $t(40)$ , 3.4,  $p<.001$

# The effectiveness of scaffolding was measured by correlation between formative & summative assessment performance.

## Data analysis:

- Linear and Multiple Regression
- P value ( $\alpha = .05$ ) important but also looked at  $r$  and  $r^2$  values for strength of correlations
- **Impact on Final Grades**
  - Homework
  - Quizzes
- **Impact on Final Exam**
  - Module 8 Discussion





# Evidence of effective scaffolding

## Relationship with End of Course Grades

	Correlation	Probability	Association
Homework	$r = .97$	$P < .001^*$	Very Strong +
Quizzes	$r = .94$	$P < .001^*$	Very Strong +
Assignments	$r = .96, (r^2 = .92)$	$P < .001^*$	Very Strong +
Discussions	$r = .95, (r^2 = .90)$	$P < .001^*$	Very Strong +

## Relationship between key activities

	Correlation	Probability	Association
Midterm Review to Midterm Score	$r = .91$	$P < .001^*$	Very Strong +
Module 8 Discussion to final exam	$r = .67$	$P < .001^*$	Strong +

**Do SRL  
behaviors  
impact  
performance?**



**Time on Task**



**Page Views**





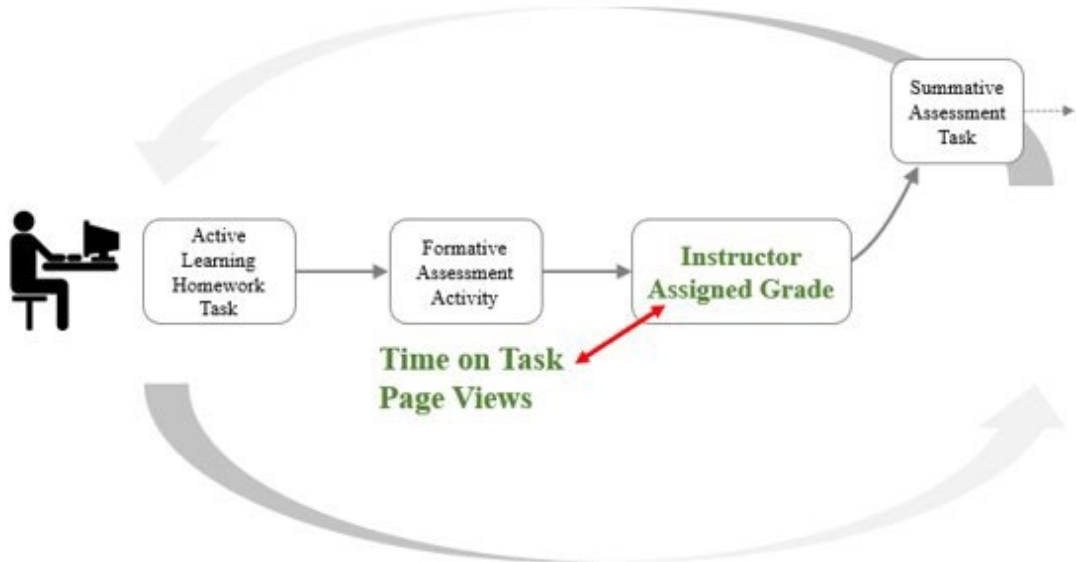
# The influence of SRL was measured by correlation between behaviors and performance

200-level statistics course (asynchronous)  
Three course sections over 2 nine-week terms, same instructor (n=85)

### Data analysis:

- Linear and Multiple Regression
- P value ( $\alpha = .05$ ) important but also looked at r and r<sup>2</sup> values for strength of correlations

- SRL behaviors:
  - Time in course
  - Number of Page views





# SRL behaviors influenced performance

Time in the course was one but not the only factor on performance

	Correlation	Probability	Association
Course grade	$r = .23$	$P = .033^*$	Weak+
Homework	$r = .25$	$P = .021^*$	Weak +
Quizzes	$r = .25$	$P = .020^*$	Weak +
Midterm Prep Homework	$r = .34$	$P < .001^*$	Weak +
Midterm Score	$r = .41$	$P < .001^*$	Moderate +
Assignments	$r = .26, (r^2 = .07)$	$P = .490$	Weak +
Discussions	$r = .44, (r^2 = .19)$	$P = .032^*$	Moderate +





# SRL behaviors influenced performance

Page views was one but not the only factor on performance

	Correlation	Probability	Association
Course grade	$r = .32$	$P = .003^*$	Weak +
Homework	$r = .31$	$P = .004^*$	Weak +
Quizzes	$r = .27$	$P = .013^*$	Weak +
Assignments	$r = .37, (r^2 = .14)$	$P = .06$	Weak +
Discussions	$r = .31, (r^2 = .10)$	$P = .37$	Weak +





# Key Takeaways:

The course provided adequate scaffolding to prepare students.

- Strong correlations noted between formative and summative assignments

SRL behaviors are only one of many factors that influence performance.

- Time and page views had moderate or weak positive correlations with student performance
- Homework and quizzes showed strongest correlations



# **All studies have limitations.**

Atypical term length (9 weeks).

Demographics not analyzed. Tested student population may not be generalizable.

SRL behaviors from (just) online course were analyzed.


COVID-19 had widespread impacts that may have impacted the study.

# Think, pair, share....

- THINK (1 minute)
  - What course would I like to explore scaffolding and/or SRL behaviors in assessments?
  - What is a question I could ask and answer with LMS data?
- PAIR (5 minutes)
  - What data would we need to answer this question?
  - What other variables might influence performance?
- SHARE (5 minutes)
  - What ideas have you had from this activity?



# Best Practice: Standardize key aspects of delivery

  
**STAT 211**  
Statistics with Aviation Applications  
Online Course Syllabus

**Credit Hours:** 3  
**Delivery Method:** Online (Internet/Canvas)

**Required Course Materials**

**Business Statistics**  
Edition: 4th  
Year: 2019  
ISBN: MyLab Stat Canvas for Business Statistics w Direct Integration Access Code Card ISBN: 9780137584352  
Author: N. R. Sharpe, R. D. De Veaux, and P. F. Velleman  
Publisher: Pearson

**Suggested Course Materials**


**Publication Manual of the American Psychological Association**  
Edition: 7th  
Year: 2019  
ISBN: 978-1433832154 (Hardcover), 978-1433832161 (Paperback), 978-1433832178 (Spiral-bound), 9781433832185 (eBook)  
Author: American Psychological Association  
Publisher: American Psychological Association

**Course Description**  
This course is a study of basic descriptive and inferential statistics. Topics include types of data, sampling techniques, measures of central tendency and dispersion, elementary probability, discrete and continuous probability distributions, sampling distributions, hypothesis testing, confidence intervals, and simple linear regression.  
Prerequisite(s): Prerequisite(s): MATH 111 or MATH 140 or MATH 143 or MATH 241.

**Course Goals**  
Enable students to select and apply appropriate descriptive and inferential statistical techniques to analyze varying types of data, to defend the rationale for selection of the techniques, and to effectively communicate results of their analyses.

**Learning Outcomes**  
Upon course completion, students will be able to:  
1. Construct, compute, and use appropriate graphical displays and numerical measures to make accurate conclusions about data.

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▼ Assignments		20% of Total	+	:
Module 2 - Assignment: The Longer You Wait, The More You Spend?	Module 2 - Standardized Scores and Correlation (xx/xx/xx - xx/xx/xx) Module   Due Jan 23, 2022 at 11:59pm   100 pts	✓	:	
Module 3 - Assignment: Statistics in the Media (PLG1)	Module 3 - Probability (xx/xx/xx - xx/xx/xx) Module   Due Jan 30, 2022 at 11:59pm   100 pts	✓	:	
Module 5 - Assignment: Beyond Paper & Ink (PLG1)	Module 5 - Midterm Exam and Data Visualization (xx/xx/xx - xx/xx/xx) Module   Due Feb 13, 2022 at 11:59pm   100 pts	✓	:	
Module 6 - Assignment: Random Number Generators (PLG1)	Module 6 - Populations, Samples, and Sampling Techniques (xx/xx/xx - xx/xx/xx) Module   Due Feb 20, 2022 at 11:59pm   100 pts	✓	:	
Module 7 - Assignment: Statistics and Advertising (PLG1)	Module 7 - Confidence Intervals for Proportions and Means (xx/xx/xx - xx/xx/xx) Module   Due Feb 27, 2022 at 11:59pm   100 pts	✓	:	
Module 9 - Assignment: Reflection Video	Module 9 - Final Practical Exam (xx/xx/xx - xx/xx/xx) Module   Due Mar 13, 2022 at 11:59pm   100 pts	✓	:	
▼ MyLab Midterm Exam		15% of Total	+	:
M5-Ch1-7 MT Exam	Module 5 - Midterm Exam and Data Visualization (xx/xx/xx - xx/xx/xx) Module   Due Feb 13, 2022 at 11:59pm   100 pts	✓	:	
▼ Final Practical Exam		15% of Total	+	:
Module 8 - Final Practical Exam: Part I	Module 8 - Hypothesis Testing, P Values, and Confidence Intervals (xx/xx/xx - xx/xx/xx) Module   Due Mar 6, 2022 at 11:59pm   100 pts	✓	:	
Module 9 - Final Practical Exam: Part II (PLG1)	Module 9 - Final Practical Exam (xx/xx/xx - xx/xx/xx) Module   Due Mar 13, 2022 at 11:59pm   100 pts	✓	:	



# Recommendations

Before designing an intervention aimed at your scaffolded assessments, test the effectiveness of the scaffolding first for your baseline.

Design formative assessment activities, instructions, and rubrics to promote active learning. One approach is to teach SRL skills through the scaffolding.

Consider SRL behaviors at all phases.

Consider what factors influence student performance (e.g. Different instructors or different course layout section to section). If they cannot be controlled, they will limit the interpretation of your results)





# References

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## Questions?

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## Session 17d



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