Evaluation of Student Engagement Across Differing Introductory-Course Activities

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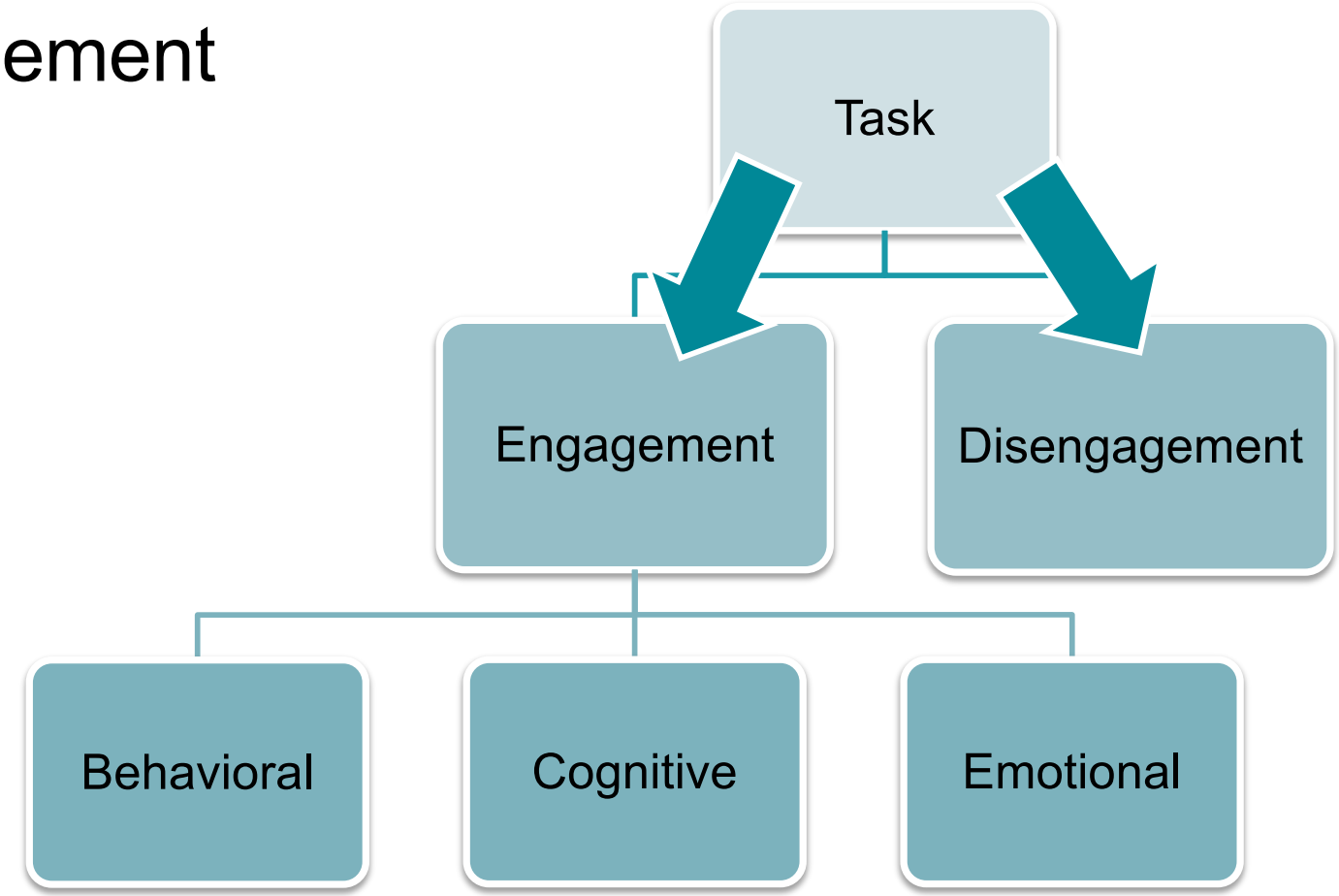
Engagement



(Fredrick, Phyllis, & Paris, 2004; Blumenfeld & Meece 1988)

What is Engagement?

Engagement	How students interact and connect to environment
Disengagement	Lack of student interaction or connection

(Lanes & Harris, 2015)

Types of Engagement

Behavioral

- Discussion
- Taking notes
- Participation in activity

Cognitive

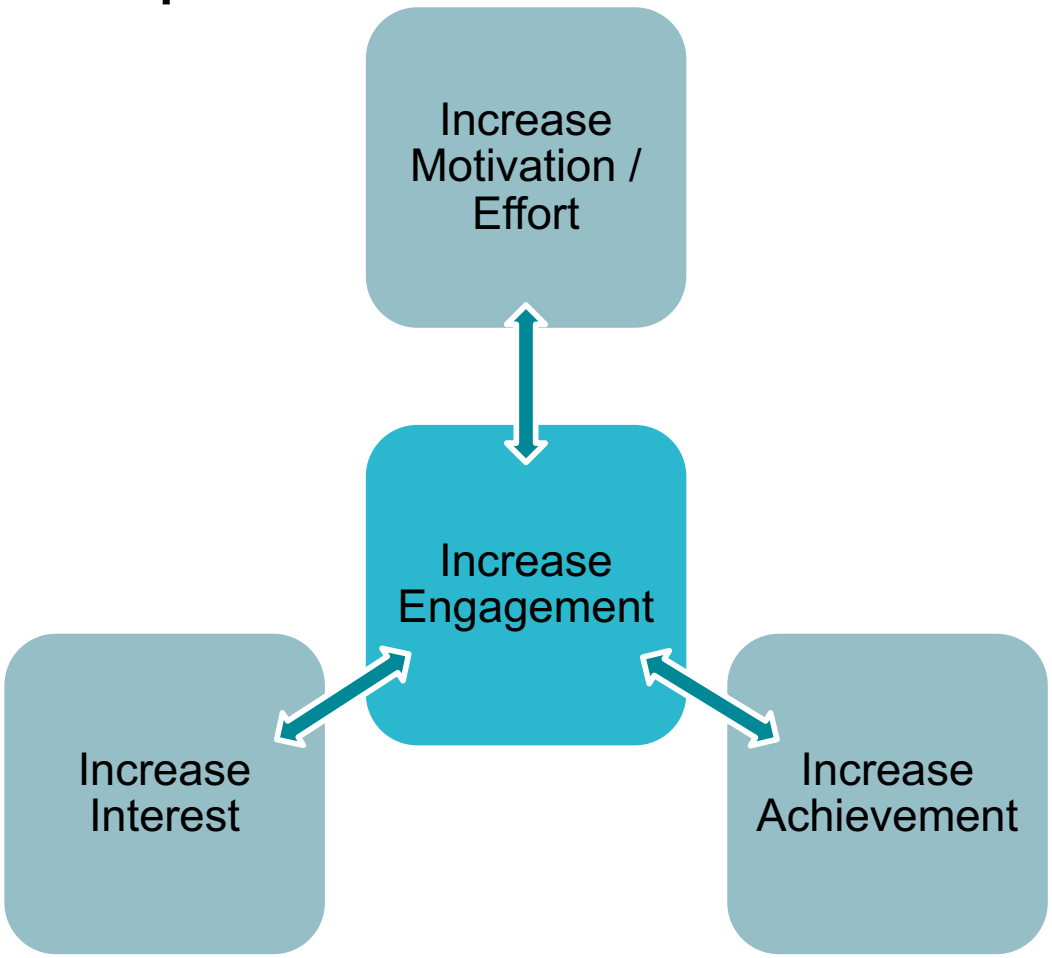
- Thinking about / focusing on topic
- Connecting to past knowledge
- Creating questions

Emotional

- See purpose/ usefulness
- Fun / interesting

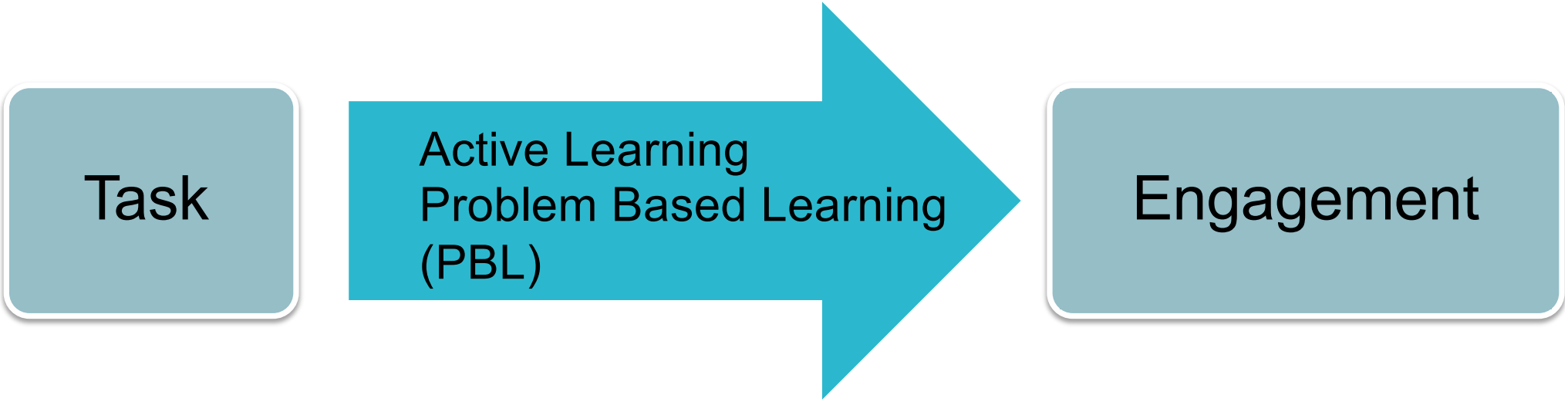
(Fredrick, Phyllis, & Paris, 2004)

Engagement Importance in Education



(Connell et al., 1994; Rotgans, 2017; Marks, 2000)

Increasing Engagement



(Blumenfeld & Meece 1988)

Active Learning

- Requires inputs from students; higher-order thinking

Problem Based Learning

- Learner-centered; information inquired; apply knowledge to solve problem

(Meyers & Jones,1993; John R. Savery 2006)

Needed Research

- Effectiveness of implementation within classroom
- Factors of specific tasks in specific setting
- Combination of engagement assessments
  - behavioral, cognitive, emotional

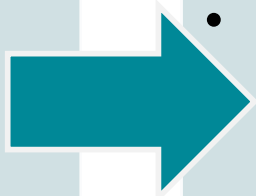
Goal

- Improve student learning experience
- Evidence based improvements
- Resources
  - “more tools in tool box”

(Connell et al., 1994; Rotgans, 2017; Marks, 2000)

Context

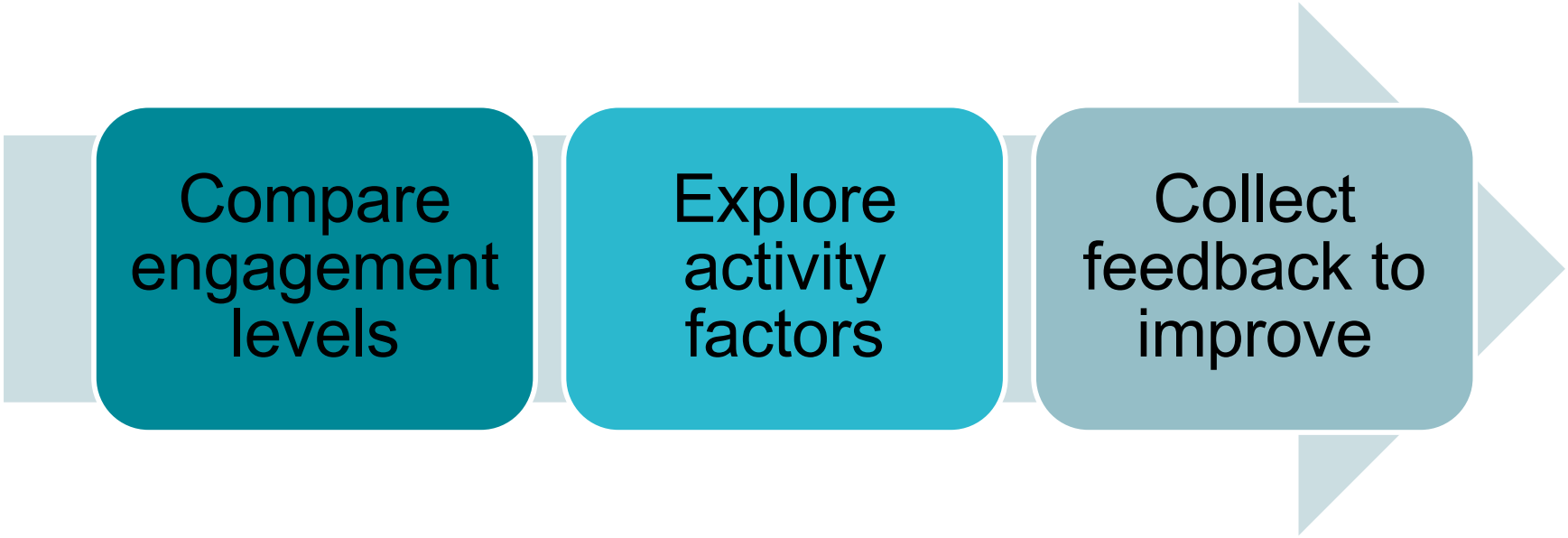
Intro Animal Science Historically	Intro Animal Science Currently
• First ANSC Experience • 100 – 200 students • Lecture & Field Trips • Sets the tone • “not inspiring”	• Active Learning • Problem-Based • Group Work • Field Trips



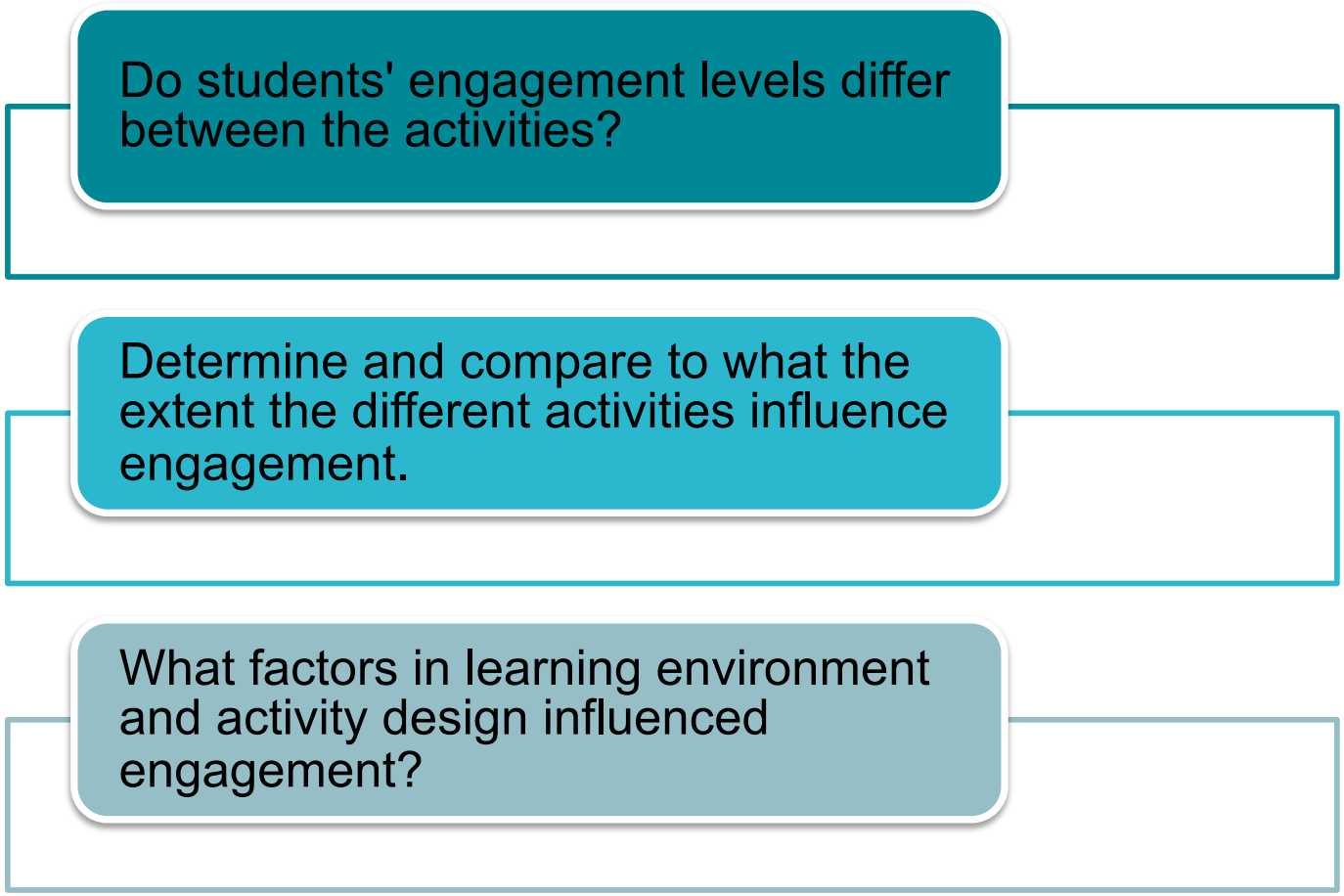
(Rotgans & Schmidt, 2011)

Purpose

To compare students' engagement level between three activities typically used in college courses (Lectures, Laboratory Stations, and Case Studies)



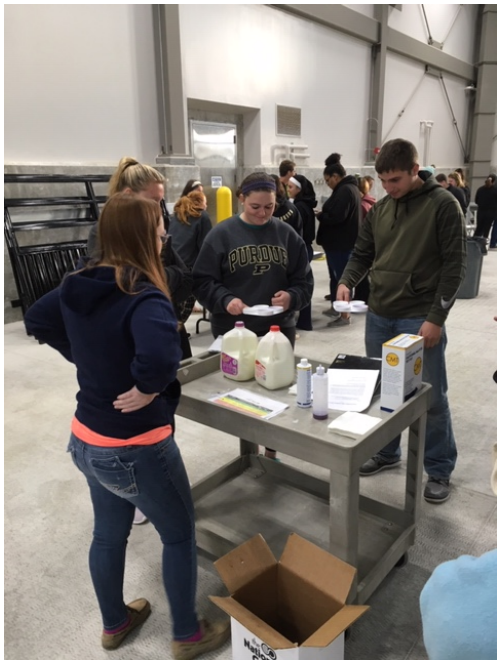
Research Questions



Methods

- 16 Week Course Fall 2018
- Two 50 Minute Lectures /wk
- One 110 Minute Lab /wk
- 178 Students

- IRB Approved
- Mixed Methods



110 Minute Lab

5 Lab Sections

7:30am
9:30am
11:30am
1:30pm
3:30pm

6 Groups per Lab Section

5 – 7 Students per Group

Methods - Treatments

- Randomly Assigned Latin Square Design

Group #	Period 1 (Week 5)	Period 2 (Week 7)	Period 3 (Week 10)
1	Lecture	Case Study	Lab Station
2	Lab Station	Lecture	Case Study
3	Case Study	Lab Station	Lecture
4	Lecture	Case Study	Lab Station
5	Lab Station	Lecture	Case Study
6	Case Study	Lab Station	Lecture

Methods – Activities

- 5 Minute Instruction, 10 Minute Activity, 10 Minutes Survey

Lecture	Lab Station	Case Study
• Watched and listened to recorded lecture slides • Individual notes optional	• Group work • Physically manipulated materials to answer questions • Individual worksheet required	• Group work • Read and discussed real life scenarios • Group worksheet required

Methods - Assesment

Assessing Student Perspective of Engagement in Class Tool (ASPECT)

- Validated & Reliable
- Survey Administered via Qualtrics
- 16 Items
- 6-point Likert Scale
  - Strongly Disagree – Strongly Agree
- 3 Subscales

(Wiggins, 2017)

Methods - Assesment

Assessing Student Perspective of Engagement in Class Tool (ASPECT)

- 3 Subscales
  - Value (9 questions)
    - Activities' influence / usefulness/ "fun"
  - Personal effort (3 questions)
    - Student interaction / input
  - Instructor contribution (4 questions)
    - Instructor aid / attitude effect on students

(Wiggins, 2017)

Methods - Assessments

Behavioral Engagement Related to Instruction (BERI)

- Video taped student activities (10 minutes max)
- 3 research assistants evaluated videos
  - Rated students engaged or disengaged
  - Set time points
  - Never repeated treatment or group evaluation
  - Cohen's kappa > 0.70

(Lanes & Harris, 2015; Landis and Koch, 1977)

Statistical Analysis

- SAS software (SAS Institute Inc., Cary, N.C.)
- Significance $p < 0.05$

ASPECT

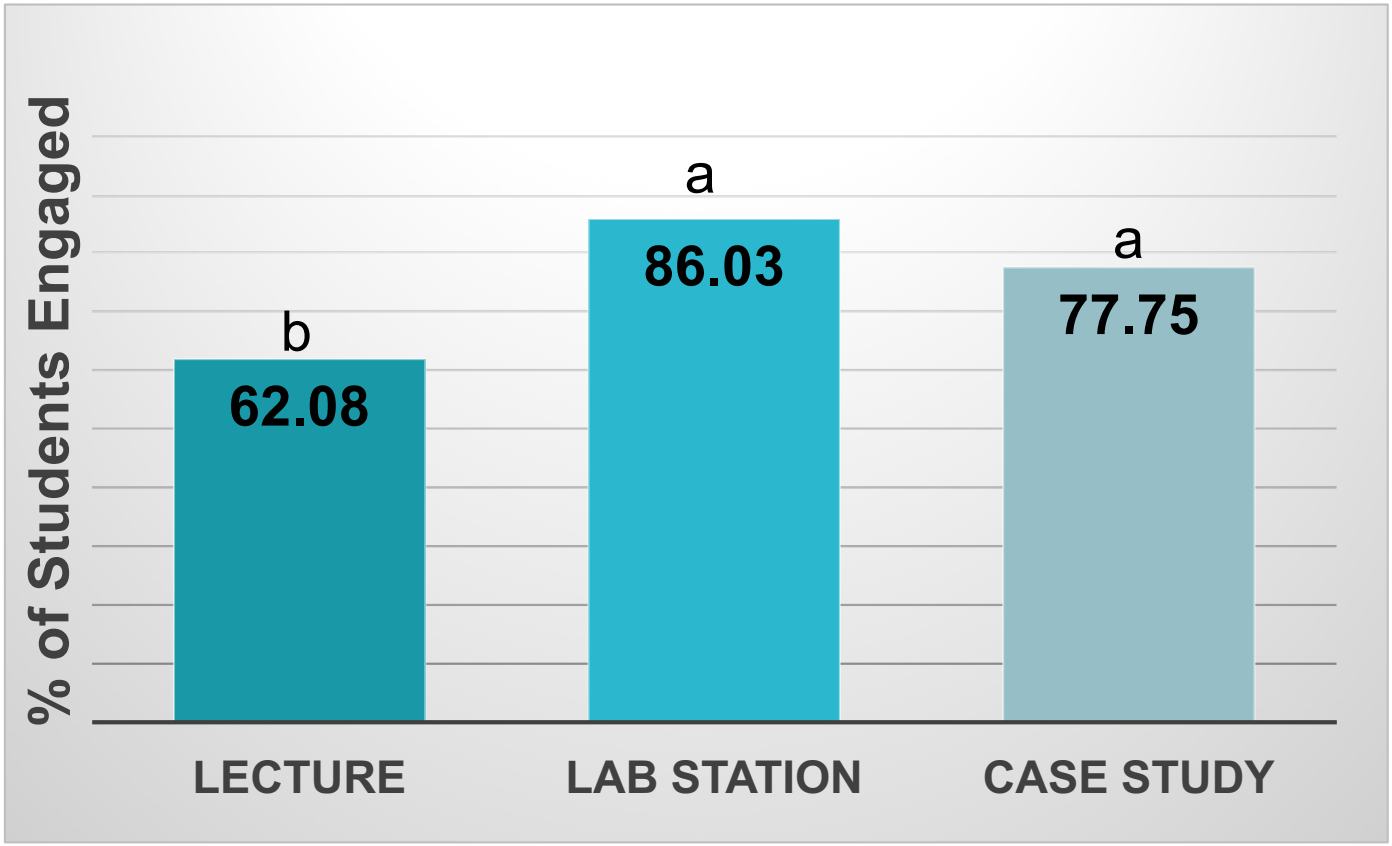
- Least squares means of treatment effect
- MIXED procedure
- Schwarz's Bayesian Information Criteria (BIC) for best fit
- No data were excluded

BERI

- Average BERI scores for each experimental activity for each group
- MIXED procedure
- Schwarz's Bayesian Information Criteria (BIC) for best fit
- No data were excluded

Results:

Behavioral Engagement Related to Instruction (BERI)



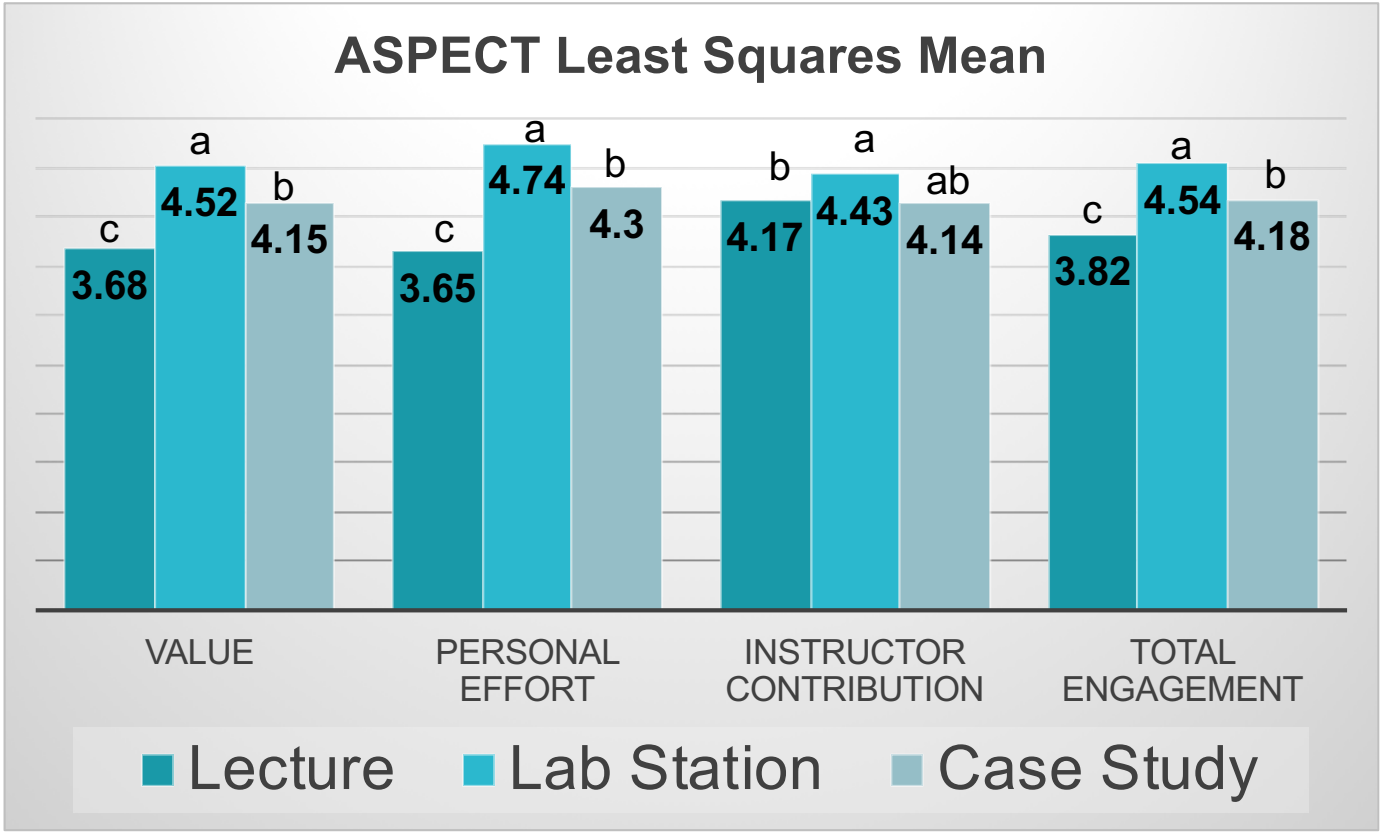
p < 0.001

Results:

Assessing Student Perspective of Engagement in Class Tool (ASPECT)

ASPECT Cronbach's Alpha (Raw)	
Value	0.930
Personal Effort	0.921
Instructor Contribution	0.806
Total Engagement	.952

p < 0.05



Results:

Assessing Student Perspective of Engagement in Class Tool (ASPECT)

- Individual ASPECT items with significant difference between all activities
  - $p < 0.05$
- Engagement Ratings: Lab Station > Case Study > Lecture
- Emerging Themes
  - Psychological influence- cognition & emotional
  - Group Influence – cognition & behavior

(Creswell 2013; Creswwll & Miller 2000)

Results:

Assessing Student Perspective of Engagement in Class Tool (ASPECT)

Psychological Influence

- I **had fun** during today's ___ activity.
- The____ activity **stimulated my interest** in the course material
- I was **focused** during today's ___ activity

Group Influence

- I made a valuable contribution to **my group** today
- **Group discussion** during the _____ activity contributed to my understanding of the course material
- Overall, the other members of **my group** made valuable contributions during the ___ activity.

Discussion:

Assessments

- Aligns and supports literature
- Pair well together

Group Dynamics

- Very influential
  - Helpful or harmful
- Tool to increase enjoyment, achievement, & engagement
  - Role assignments and peer evaluations

Challenge Level

- Enjoyment & interest connected to challenge level
  - “Challenging but achievable”

(Strati, 2017; Fredricks, 2002; Meyers & Jones,1993; John R. Savery 2006)

Conclusions:

Take-Aways

- Improve / Refine
  - Purposeful and evidence based
- Assessments able to capture multiple types & levels
  - BERI & ASPECT work well together
- Lab Stations > Case Studies > Lecture
  - Group dynamic
  - Physical materials
  - Make them think

Limitations

Students have high initial interest

- Self selected into course

One semester sample

- Caution over generalizing

Limited Time

- Testing effect

Thank You

Questions?