The use of Lecture Capture in Light of Teaching Approach and Content Type: An Institution-Wide Study

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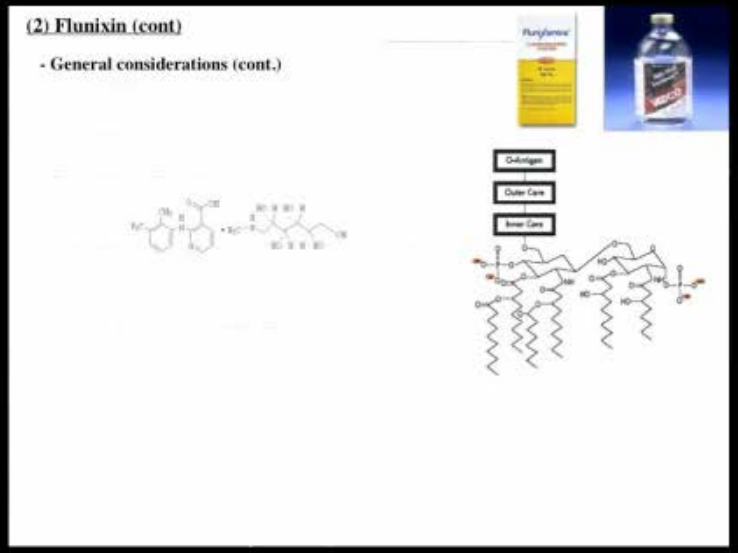
AAVMC

Lecture Capture (in our context)

- Each full course session captured
  - Audio of instructor
  - Video of whatever is displayed on the computer
  - Video (small) of the instructor
  - Podcast and Vodcast available (instructor preference)

BMS 354- Pharmacology (12S-BMS 354) Spring 2012

1



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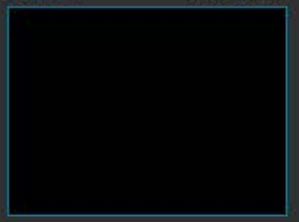
APPS

Applications

SCENE 1 00:00 - 01:00



SCENE 2 01:00 - 06:00

SCENE 3 06:00 - 07:14

SCENE 4 07:14 - 09:40

SCENE 5 09:40 - 14:40

00:09:43 / 00:53:01

1 2 APPS

echo360

(4) Propionic acid derivatives (profens)

(A) Ibuprofen
(B) Ketoprofen
(C) Carprofen
(D) Naproxen

General considerations of the "profens" and the profen derivative naproxen

- most nephrotoxic NSAID group
- non-selective: except for carprofen

(A) Ibuprofen: not safe in veterinary patients

(B) Ketoprofen:

- COX inhibitor and a partial LOX inhibitor

Echo 360 Use at the ISUCVM

- Students self-reported access, on average (per survey):

	Average Week	Heavy Use Week	Light Use Week
Average	2.4	5.3	1.1
Max	10	30	6
Min	0	0	0

Why do students use captured lectures?

- Review key points
- Obtain additional clarity
- Make up for unavoidable conflicts
- Review for tests

(Simpson, 2006; Wilson & Weiser, 2001; Winer & Cooperstock, 2002; Yudko, Hirokawa, & Chi, 2008)

- Provide quality audio and ability to pause/replay for 2nd language learners

(Simpson, 2006)

Research Questions

What is the relationship between…

1. instructor teaching approach and the attitudes that instructors and students have towards lecture capture?

2. course content type and the attitudes that instructors and students have towards lecture capture?

3. use of lecture capture and learning outcomes? Is this relationship associated with teaching approach or course content?

Population

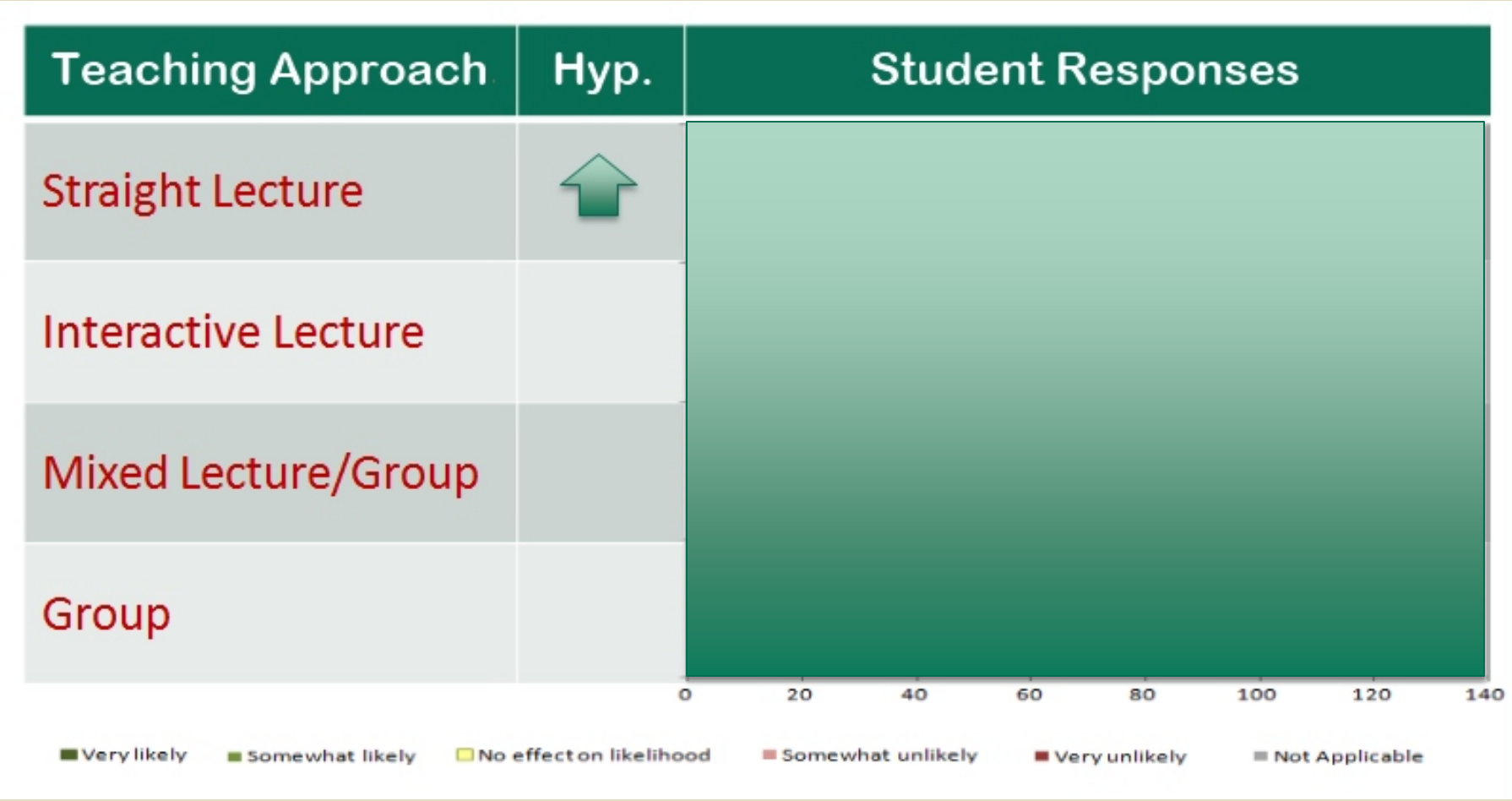
- Survey sent to 565 veterinary students
  (yrs. 1-4, 75% female; 25% male)
- Respondents: 222 (39%)

Self-reported use of Echo:

- Have you ever reviewed lectures captured by Echo?
  - 218 (98.2%) – Yes
  - 4 (1.8%) – No

Teaching Approach

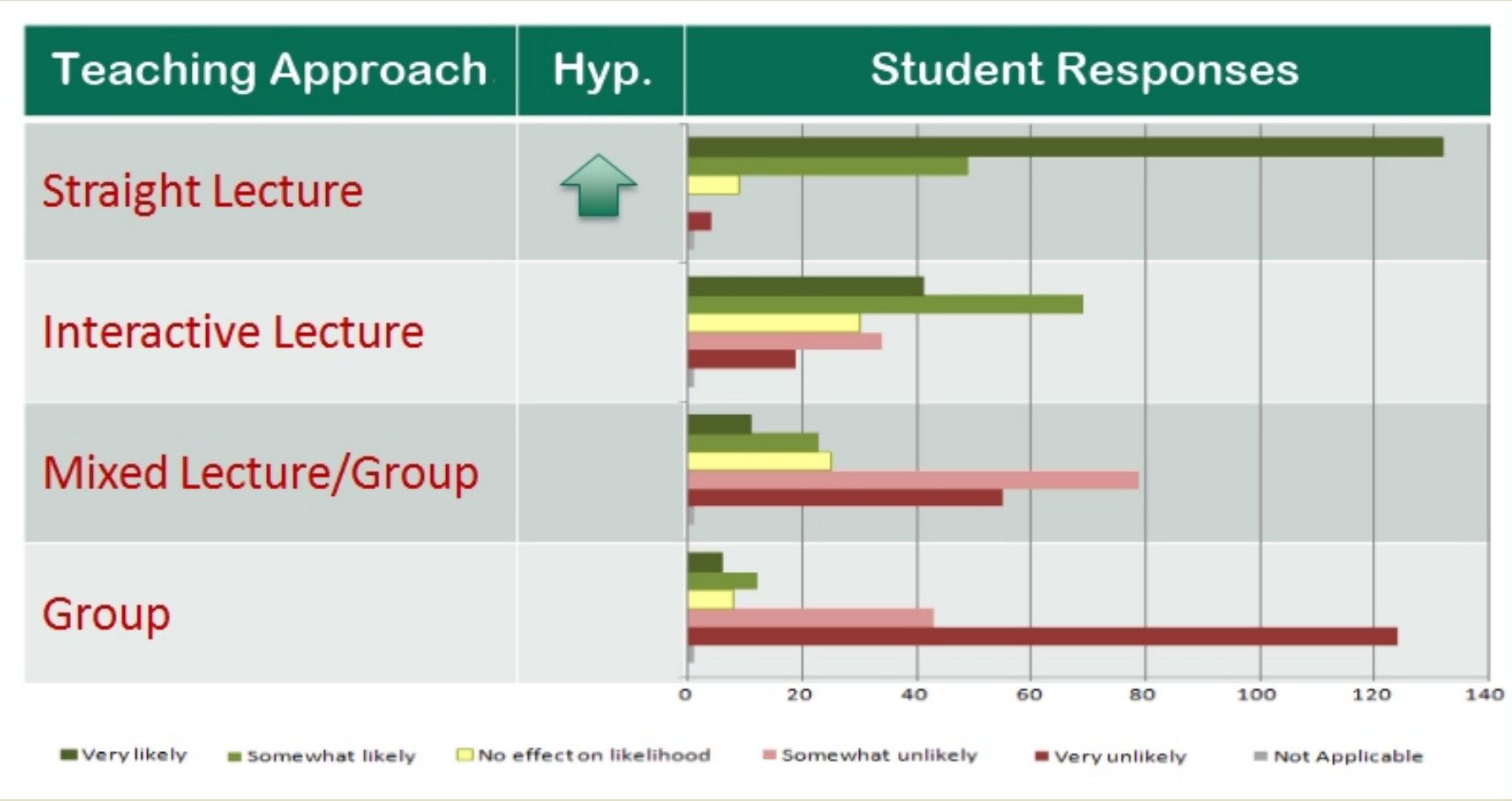
Hypotheses and Results



The teaching approaches were significantly different from each other [Wilcoxon Test. – ($p < 0.0005$)]
Friedman test for non-parametric data (N = 191, Chi-Square 429.567, df = 3, Sig < 0.0005);

Teaching Approach

Hypotheses and Results



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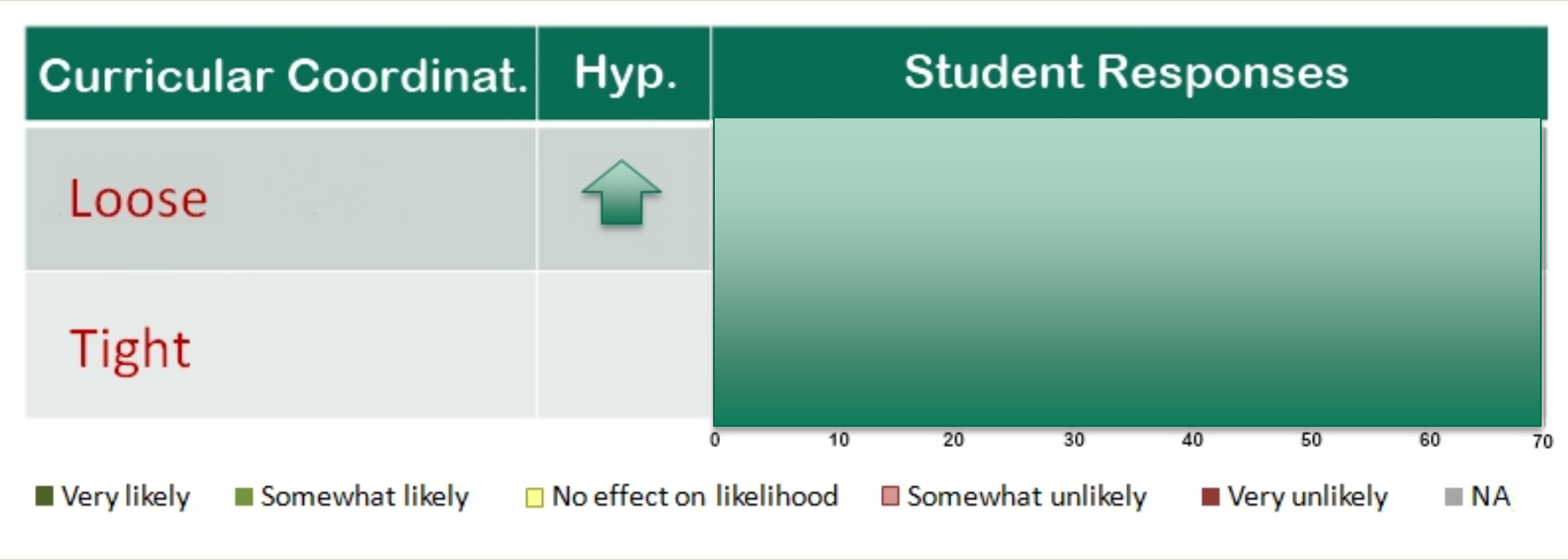
Curricular Coordination

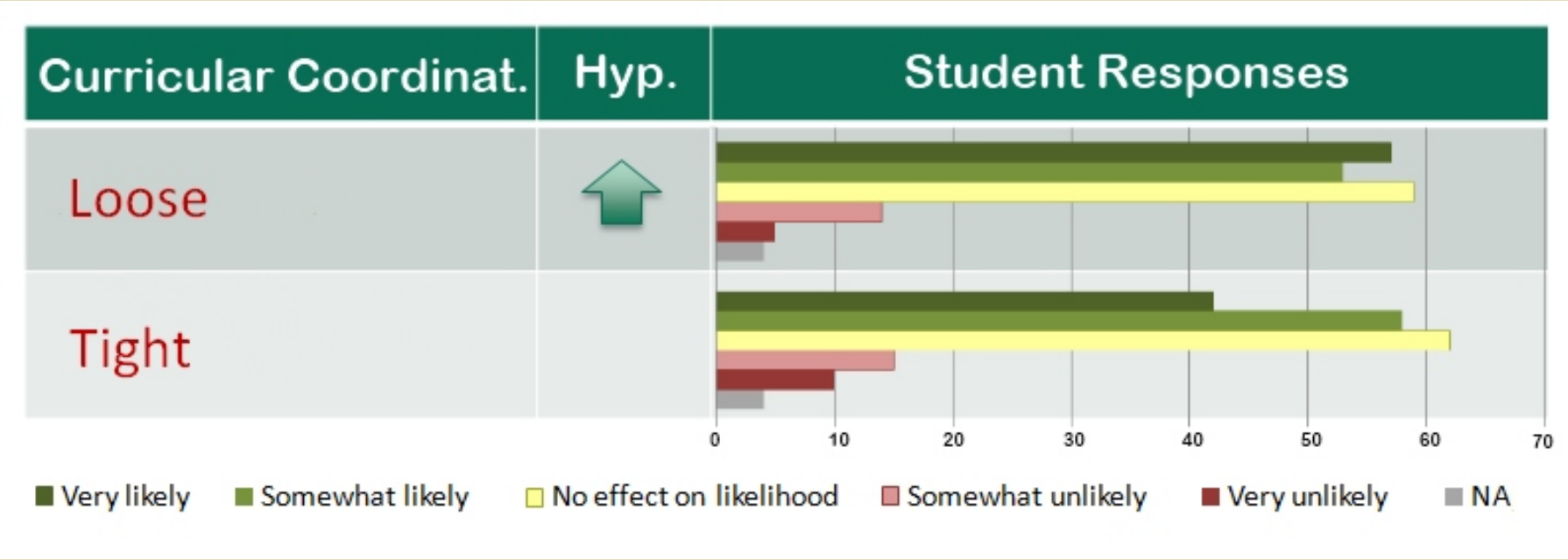
Hypotheses and Results



No significant differences between curricular coordination styles [Wilcoxon Signed Ranks Test (Z = -1.798, Sig = 0.072)]

Curricular Coordination

Hypotheses and Results

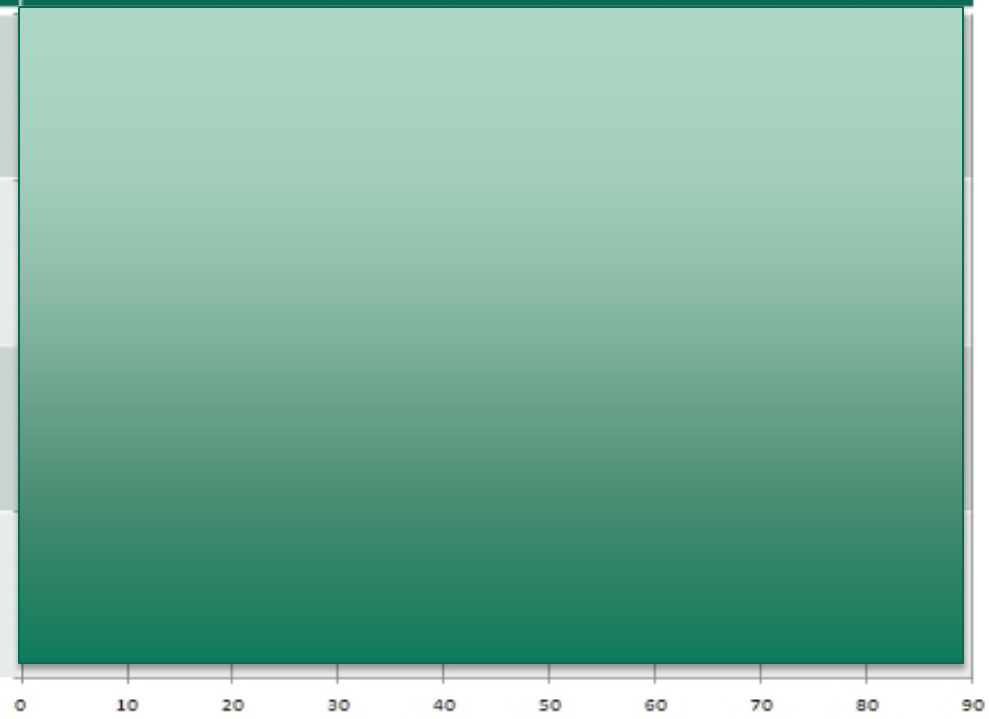


No significant differences between curricular coordination styles [Wilcoxon Signed Ranks Test (Z = -1.798, Sig = 0.072)]

Content

Hypotheses and Results

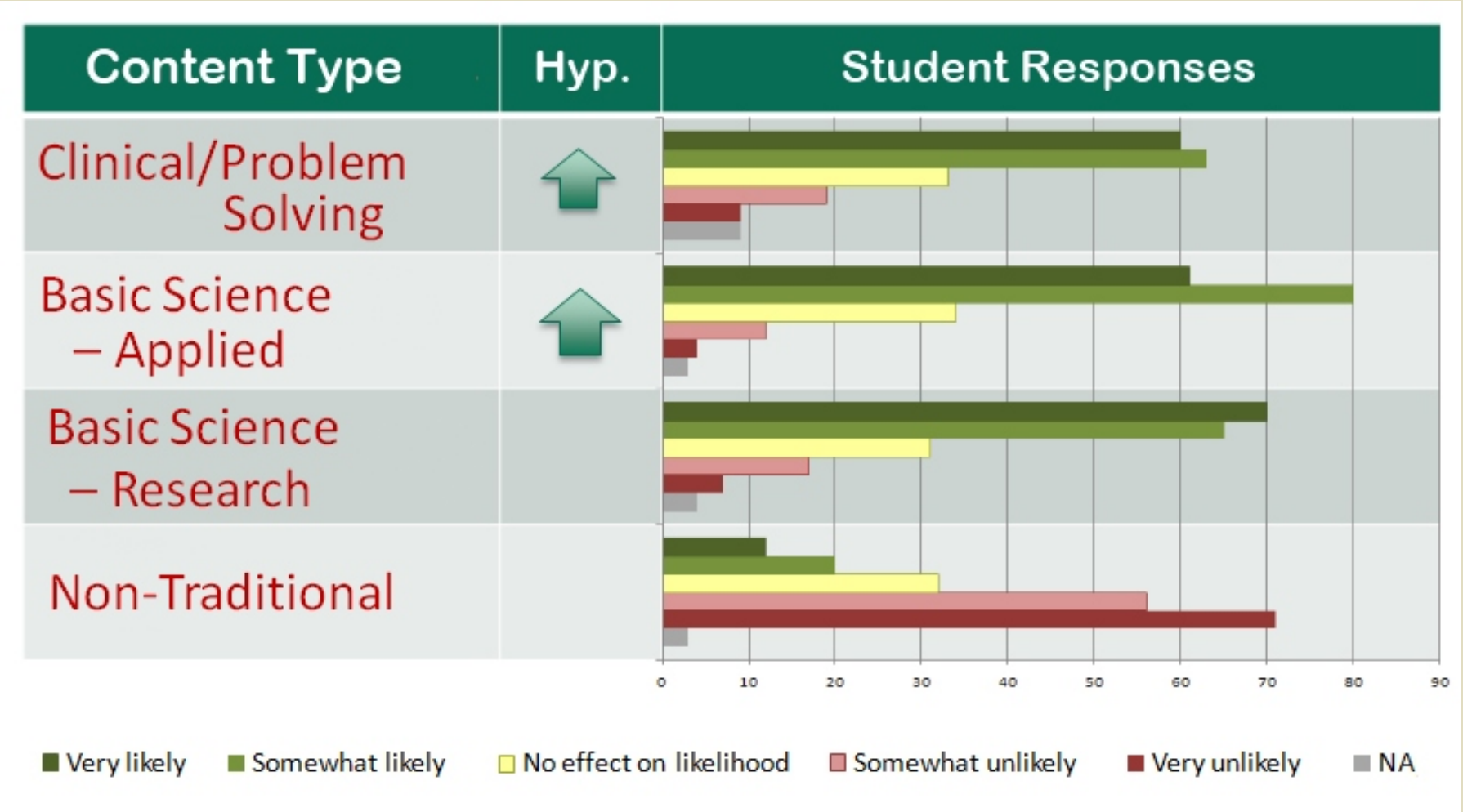
Content Type	Hyp.	Student Responses
Clinical/Problem Solving	↑	
Basic Science – Applied	↑	
Basic Science – Research		
Non-Traditional		



The Non-Traditional classes were significantly different from all others [Wilcoxon Signed Ranks Test].
Friedman Test (N = 181, Chi-Square = 229.810, df = 3, $p < .0005$);

Content

Hypotheses and Results

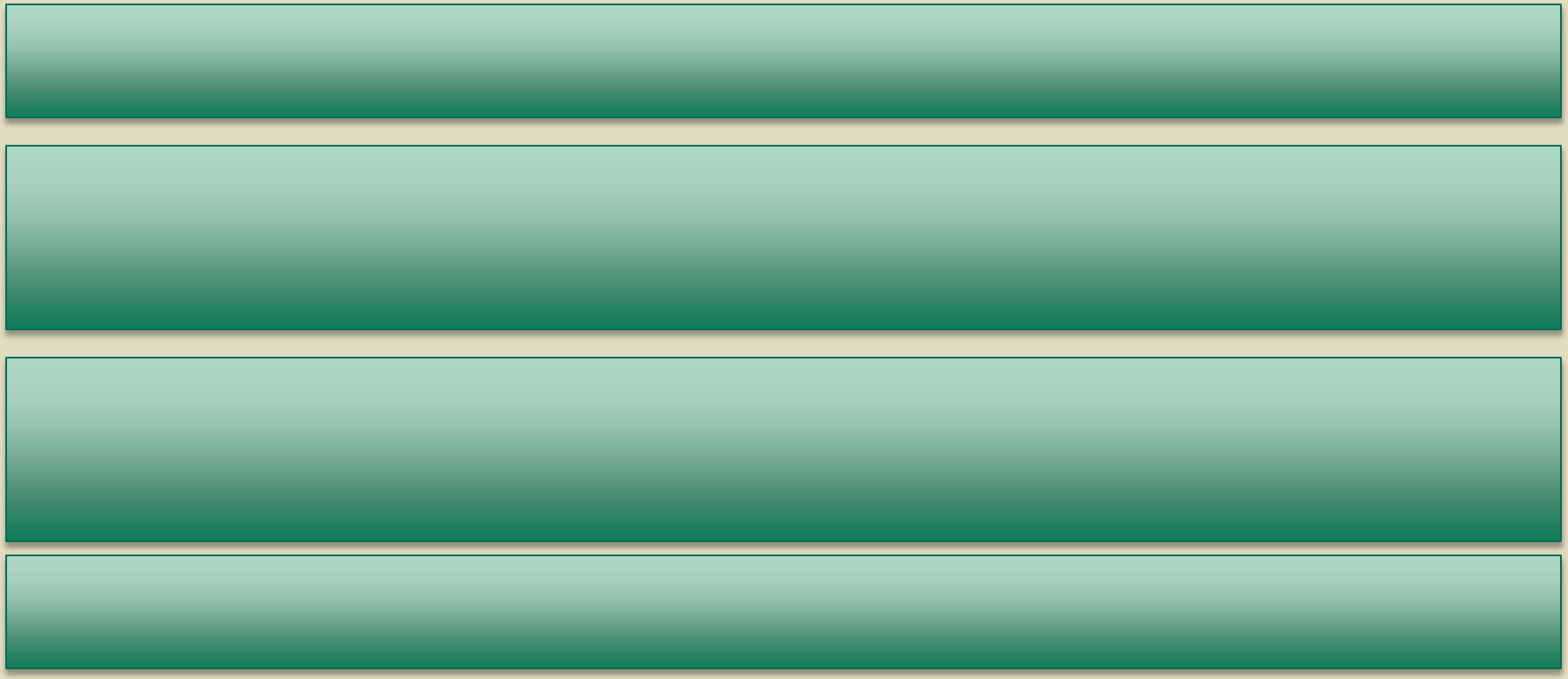


The Non-Traditional classes were significantly different from all others [Wilcoxon Signed Ranks Test].
Friedman Test (N = 181, Chi-Square = 229.810, df = 3, $p < .0005$);

Frequent* Important Purposes:

(n = 199 – 201)

Purpose/Condition	Average

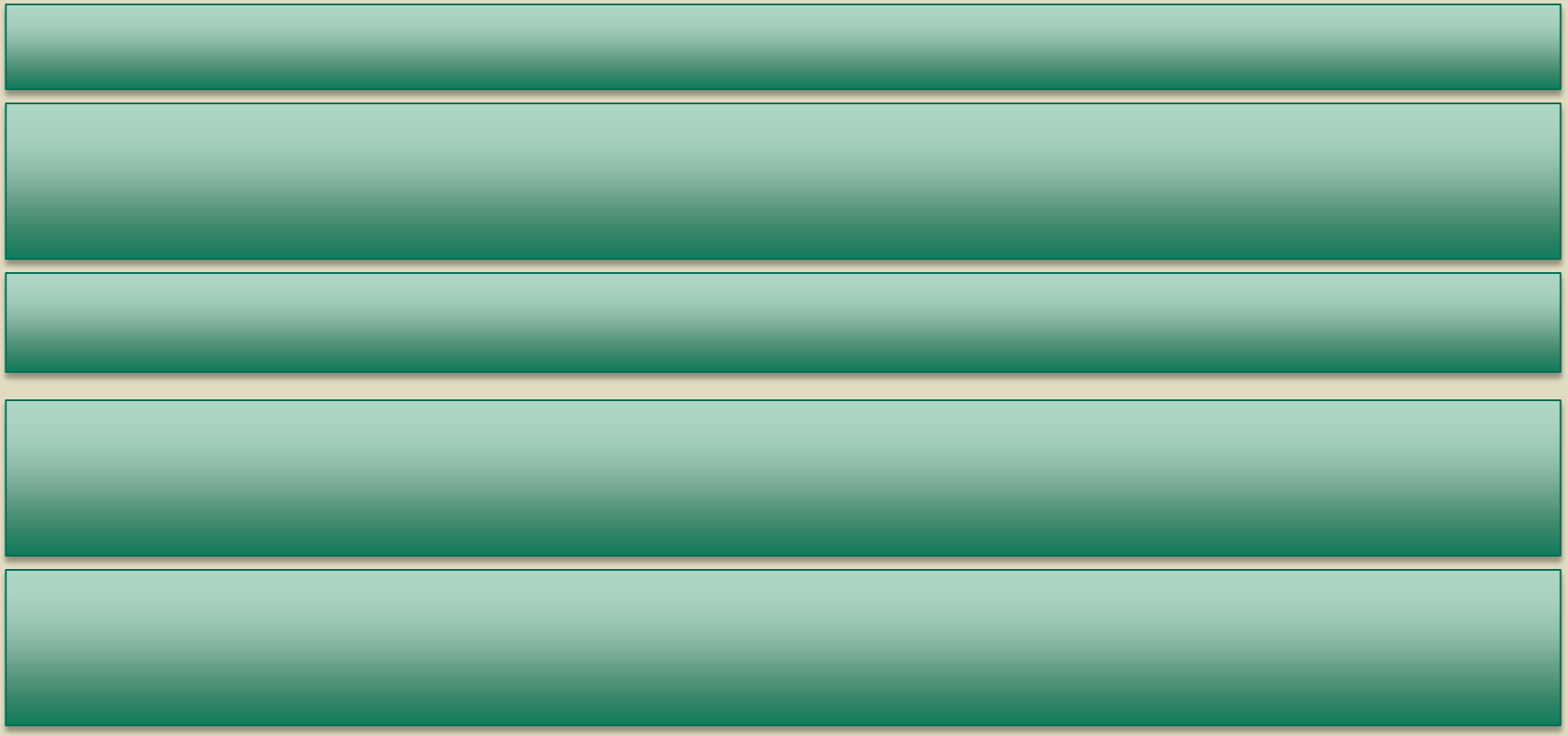


* One-Samples T-test, p< .05

Scale: 5 = Almost Always, 4 = Freqently, 3 = Neither Frequently nor Infrequently, 2 = Infrequently, 1 = almost never

Instructor/lecture characteristics that increase likelihood of accessing lectures

Characteristic	Average



One sample t-test P <.05

5 = Very Likely, 4 = Somewhat Likely, 3 = No effect on Likelihood, 2 = Somewhat Unlikely, 1 = Very Unlikely

Instructor/lecture characteristics that decrease likelihood of accessing lectures

Characteristic	Average

One sample t-test P <.05

5 = Very Likely, 4 = Somewhat Likely, 3 = No effect on Likelihood, 2 = Somewhat Unlikely, 1 = Very Unlikely

Instructor/lecture characteristics that do not increase or decrease students' self-reported likelihood of accessing lectures

- Skill as a lecturer
- Organization

Big Picture

Relevance, Relevance, Relevance

- Strategic Use of Captures
- Appropriate visuals
- Relevant Content
- Missed Materials (not in notes, etc.)
- Test

Will this be helpful for review?

Faculty Survey

- Sent to all instructional faculty
- 35 (48%) responded
- Each faculty member responded for each class in which she/he taught

Instructor perspective – research questions

- Faculty attitude towards lecture capture was not associated with teaching approach, curricular coordination, or content type.

Faculty Survey

Question 1: What advantages does lecture capture provide you as an instructor?

No Advantages perceived	10
Students can review the lectures	7
I (faculty) can review my own performance	4

Faculty Survey

Question 4: What are the drawbacks to lecture capture for you as an instructor?

and

Question 6: What do you like least about the lecture capture program at ISU?

Lower class attendance	7
Students are less attentive or less likely to ask questions	5
Forced formality or less autonomy	5

Additional insight on faculty concerns . . .

- “The classroom dynamics are altered when student numbers drop below a certain point. The behavior of the INSTRUCTOR changes (based on personal experience and comments from other faculty members) when students choose to not be in the classroom. The absence of students probably has a significant effect on faculty performance...which hopefully is important in providing quality instruction.”
- “. . . it [lecture capture] dramatically changes the classroom dynamics if a significant (?) percentage of students are absent from discussions/question & answer sessions, etc.”

Learning Outcomes

Prior Research

- Studies have tended to focus on the difference in scores between those who utilized captured lectures for learning and those who didn't.
- Generally no significant differences were seen; where present, trends were inconsistent.

- Bacro, T. R. H., Gebregziabher, M., & Fitzharris, T. P. (2010). Evaluation of a lecture recording system in a medical curriculum. *Anatomical Sciences Education, 3*, 300-308.
- Franklin, D. S., Gibson, J. W., Samuel, J. C., Teeter, W. A., & Clarkson, C. W. (2011). Use of Lecture Recordings in Medical Education. *Medical Science Educator, 1*, 21-28.

Our question . . .

- Faculty (some) hypothesize – all ships sink together (i.e. you cannot just compare those who use captured lectures with those who don't). Does this happen?
- Do learning outcomes have to do with the "type" of course?

Instructor/Student perspective

In general, are you (students) more likely to learn better with lecture capture technology?

	Students		Faculty	
	n	%	n	%
Very unlikely	0	0.0%	3	9.1%
Somewhat unlikely	1	0.5%	3	9.1%
No effect on likelihood	11	5.4%	15	45.5%
Somewhat likely	48	23.4%	9	27.3%
Very likely	143	69.8%	3	9.1%

Participants

- Veterinary students (classes of 2008 – 2112; n = 614)
- 75% female; 25% male
- Average age – mid 20's. (All had completed 5 semesters of instruction at the time performance data were collected)
- All recruited using the same admissions criteria and having similar academic characteristics

Analysis of Outcomes Data

- Dependent Variable
  - Qualifying Examination (QE)
  - Comprehensive Standardized Test of Basic Science Knowledge and Skills
  - Offered after 5 semesters of instruction
  - 5 subscales
    - Anatomy
    - Physiology
    - Pharmacology
    - Pathology
    - Microbiology

Descriptive lecture capture "use" groupings

- Independent Variable -- Based on the amount of lecture captures viewed within the discipline area across all courses in that discipline over 5 semesters – (Views per student per week)
  - **none** (0 lectures accessed per week),
  - **low** (.01 – 1.3 views per week),
  - **medium** (1.4 – 2.9 views per week) views per week,"
  - **high** (> 2.9 views per week, on average.)

Class

- Class used as a covariate to control for other curricular changes/fluctuations.

Views

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
2008	--	--	--	--	--	--
2009	--	--	--	--	--	--
2010	--	--	--	0.4 (Low)	0.10 (Low)	0.5 (Low)
2011	--	2.6 (Med)	0.5 (Low)	1.9 (Med)	0.3 (Low)	5.2 (High)
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Results

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
2008					--	--
2009					--	--
2010				0.4 (Low)	0.1 (Low)	0.5 (Low)
2011		2.6 (Med)	0.5 (Low)	1.9 (Med)	0.3 (Low)	5.2 (High)
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

No significant differences by lecture views level (F = .002; p = .998):

None: 226.9 (44.5)
Low: 230.1 (44.6)
High: 233.9 (44.2)

Covariate (class) not significant (F = .398; p = .531)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Low-Views, Basic Science Applied Disciplines

Physiology

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
2009	--	--	--	--	--	--
2010	--	--	--	0.4 (Low)	0.1 (Low)	0.5 (Low)
2011	--	2.6 (Med)	0.5 (Low)	1.9 (Med)	0.3 (Low)	5.2 (High)
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

No significant differences by lecture views level (F = .820; p = .366):

None: 58.5 (11.1)
Low: 58.5 (10.1)

Covariate (class) not significant (F = 1.088; p = .297)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Pathology

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
2008	--	--	--			
2009	--	--	--			
2010	--	--	--			
2011	--	2.6 (Med)	0.5 (Low)			
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

No significant differences by lecture views level ($F = .851$; $p = .357$):

None: 65.18 (9.7)
Low: 65.0 (9.0)

Covariate (class) not significant ($F = .873$; $p = .351$)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Higher/Student – requested views – Basic Science Research/Building block orientation

Pharmacology

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
				--	--	--
				--	--	--
				0.4 (Low)	0.1 (Low)	0.5 (Low)
				1.9 (Med)	0.3 (Low)	5.2 (High)
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

There were significant differences by lecture views level ($F = 16.350$; $p < .0005$).

None: 51.7 (11.3)
Low: 52.5 (13.0)
Med: 59.5 (12.0)

Covariate (class) was also significant ($F = 8.995$; $p = .003$)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Pharmacology

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
				--	--	--
				--	--	--
				0.4 (Low)	0.1 (Low)	0.5 (Low)
				1.9 (Med)	0.3 (Low)	5.2 (High)
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

Post Hoc:

Estimated Marginal Means:

None: 46.4
Low: 52.0
Med: 63.8

All differences significant: (p<.03)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Anatomy

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
2008	--	--			--	--
2009	--	--			--	--
2010	--	--		0.4 (Low)	0.1 (Low)	0.5 (Low)
2011	--	2.6 (Med)	0.5 (Low)	1.9 (Med)	0.3 (Low)	5.2 (High)
2012	0.47 (Low)	3.1 (Med)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

Differences were significant by lecture views level ($F = 62.240$; $p < .0005$):

None: 53.7 (9.5)
Low: 60.7 (9.0)

Covariate (class) significant ($F = 11.48$; $p = .001$).

Estimated Marginal Means:

None: 53.0 (.476)
Low: 63.0 (1.043)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Mixed Disciplines/Mixed Methods/Mixed Results

Microbiology

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
2008	--	--				--
2009	--	--				--
2010	--	--				0.5 (Low)
2011	--	2.6 (Med)				5.2 (High)
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

Differences were significant by lecture views level ($F = 5.7$; $p = .004$):

None: 61.56 (9.6)
Med: 61.4 (9.9)
High: 65.5 (10.7)

Covariate (class) significant ($F = 12.474$; $p < .0005$)

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Microbiology

Class	Anatomy	Microbiology	Pathology	Pharmacology	Physiology	Overall
2008	--	--				--
2009	--	--				--
2010	--	--				0.5 (Low)
2011	--	2.6 (Med)				5.2 (High)
2012	0.47 (Low)	3.1 (High)	0.6 (Low)	1.6 (Med)	0.3 (Low)	6.1 (High)

Post Hoc Analysis

Estimated Marginal Means:

None: 64.3
Med: 59.4
High: 61.1

"None" significantly higher than "Med"; No other differences significant

Note: -- Means that no lectures were viewed, either because they were not available or the instructor did not allow viewing.

Discussion

- In two areas, use of lecture capture was not associated with any change in learning outcomes.
  - Both areas basic science applied
  - More mixed teaching methods other than straight lecture
  - Less student use of lecture capture.

Discussion

- In two areas, use of lecture capture associated with higher learning outcomes.
  - Both areas rely heavily on lecture (as opposed to mixed lecture or group work.)
  - Both areas are Basic Science – research orientation focus.
  - Associated with high use (Pharmacology) or a student-led increase in use (Anatomy) which had not been permitted by instructors.

Discussion

- One area (Microbiology) lecture capture use associated with higher means, but lower estimated marginal means when controlling for the covariate. The covariate had a more powerful effect on learning outcome than the lecture capture use, suggesting that some other factor contributed more to changes than did lecture capture.

Discussion

- No evidence to suggest that incorporating lecture capture results in reduced learning.
- More research warranted to explore the possibility that use of captured lectures is beneficial, particularly with:
  - Fact-focused “building-block” disciplines
  - Classes relying primarily on lecture
- Students, in our context, good judges of when lecture capture will be helpful (?)

Contact Information:

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