

# Integrating Web-based Student Response Systems in the Classroom

A case study of Top Hat Monocle in a Commodity Futures Course

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# Today's Digital Student

- It can be difficult to engage today's “express” minded student
  - Generation Y
    - Introduction of the internet
    - Increased use of communication, media and digital technologies
  - Generation Z
    - Highly connected and technology driven
    - Nicknamed “digital natives”
    - Have never known a world without internet

## Today's Digital Student (cont'd)

- Especially difficult in large-enrollment classrooms
  - Many students, many different learning types
  - Time consuming
  - Students can get lost in the crowd



## Methods (cont'd)

- **Study Group:**
  - 109 students total
    - 76 opted in (70%)
    - 33 did not (30%)
- **Survey Design:**
  - 2 surveys
  - Attached to exams
  - Question formatting
    - Multiple Choice
    - Short answer



- **Bonus Points:**
  - Students were incentivized to sign up
  - Maximum 5% of grade or 20 points

# Methods (cont'd)

- Top Hat
  - Industry leader being used by over 250



The image shows a promotional graphic for Top Hat. The background is a blurred image of a crowd of people. In the top left corner, there is a logo for TOP HAT. In the top right corner, there are links for Tour, Testimonials, and Pricing. The main text reads "Make every lecture count". Below this, it says "Top Hat transforms your students' mobile devices into powerful classroom engagement tools." In the bottom right corner, there is a hand holding a smartphone displaying the Top Hat mobile app interface. The app screen shows a question: "How well did you grasp today's concepts?" with three multiple-choice options: A) I understood it completely, B) There were some grey areas, and C) I have a weak understanding.

TOP HAT

Tour Testimonials Pricing

## Make every lecture count

Top Hat transforms your students' mobile devices into powerful classroom engagement tools.

TOP HAT

Question 13

How well did you grasp today's concepts?

A I understood it completely

B There were some grey areas

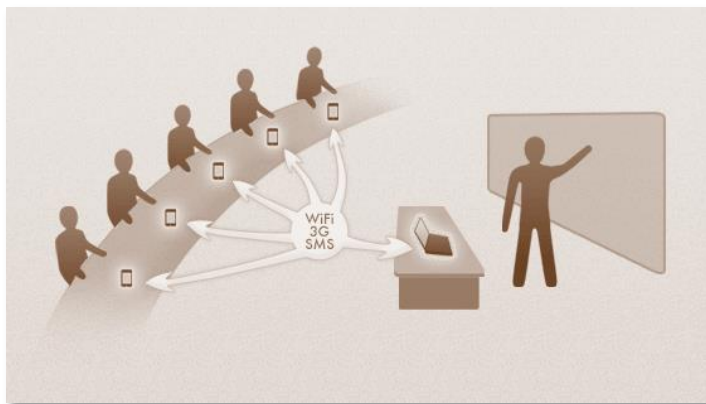
C I have a weak understanding

# Methods (cont'd)

- **Top Hat**

- **How it all works**

- Computer and Wi-Fi via the classroom
    - Used laptops, cellphones, smartphones
    - Logged into the course portal via Wi-Fi and cellular infrastructure to enable



ex



## Methods (cont'd)

- The two groups were compared statistically and regressed (OLS regression model) using the following variables:
  - Dependent Variable
    - Course grade

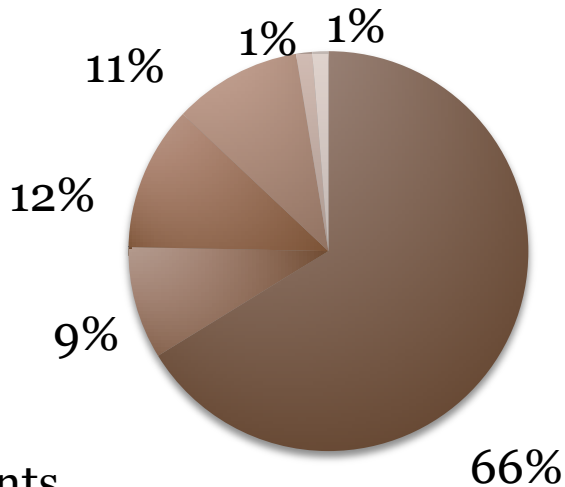


# Methods (cont'd)

- Independent variables
  - Reason for enrollment
  - Exam grades
  - Motivation for attendance
  - Understanding of material
  - Comparison to traditional outside questions
  - Engagement with lectures
  - Technology dislikes

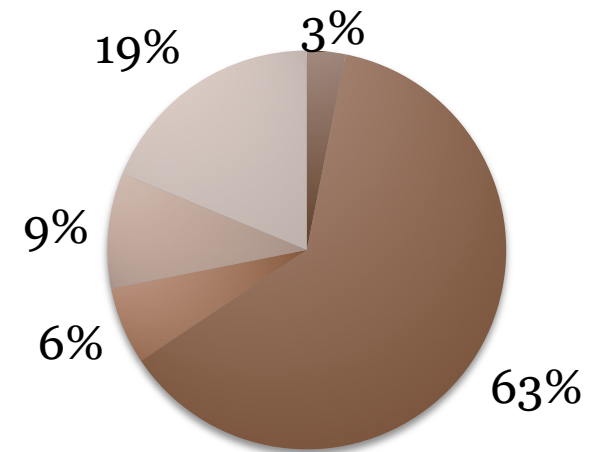
# Results: Students' Perceptions

## Why Did You Enroll in Top Hat?



- Bonus Points
- Improve Overall Grade/Learning
- No Response
- Keep Me Focused/Participation
- Thought it was Mandatory
- It was New/Interesting

## Why Did You Not Enroll in Top Hat?



- Low/No Signal
- Didn't Want to Spend \$
- Not Enough Incentive
- No Response
- Had Problems with Setup or Payment/Too Complicated

# Results: Correlations

	Grade	Bonus Grade	Exam 1	Exam 2	Exam 3	Final Score	GPA
Grade	1						
Grade with Bonus points	<b>0.978</b>	1					
Exam 1	0.690	0.685	1				
Exam 2	0.736	0.734	0.378	1			
Exam 3	0.796	0.770	0.386	0.431	1		
Final Score	0.637	0.610	0.351	0.293	0.294	1	
GPA	<b>0.559</b>	0.550	0.347	0.484	0.460	0.287	1

- Participation in Top Hat improved the course grade
- Student GPA was a good predictor of the course grade

Does Top Hat really help students to learn more?  
 In answering this question we consider both the data and students perceptions

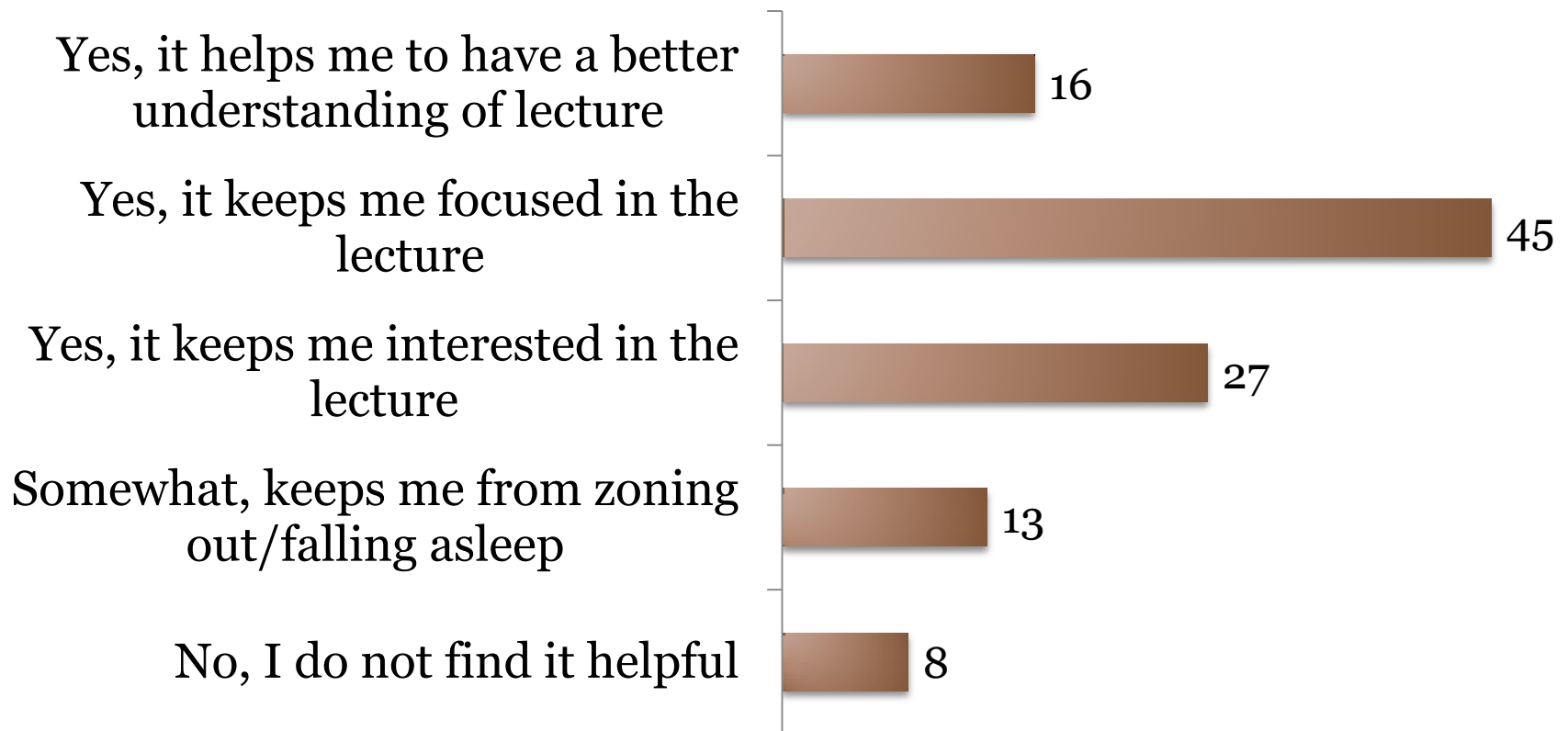
# Results: Relationship to Course Grade

- Students who were enrolled in Top Hat did better as a group than students who were not enrolled
  - **Base Group: Non-enrolled students**

SUMMARY OUTPUT			
Regression Statistics			
Adjusted R Square	0.03		
Observations	109		
	Coefficients	t Stat	P-value
Intercept	333.01	57.578	2.4E-82
Enrollment	<b>13.91</b>	<b>2.009</b>	<b>0.046</b>

# Results: Students' Perceptions

**Do you find that THM helps to keep you better engaged in the lecture?**



# Results: Relationship to Course Grade

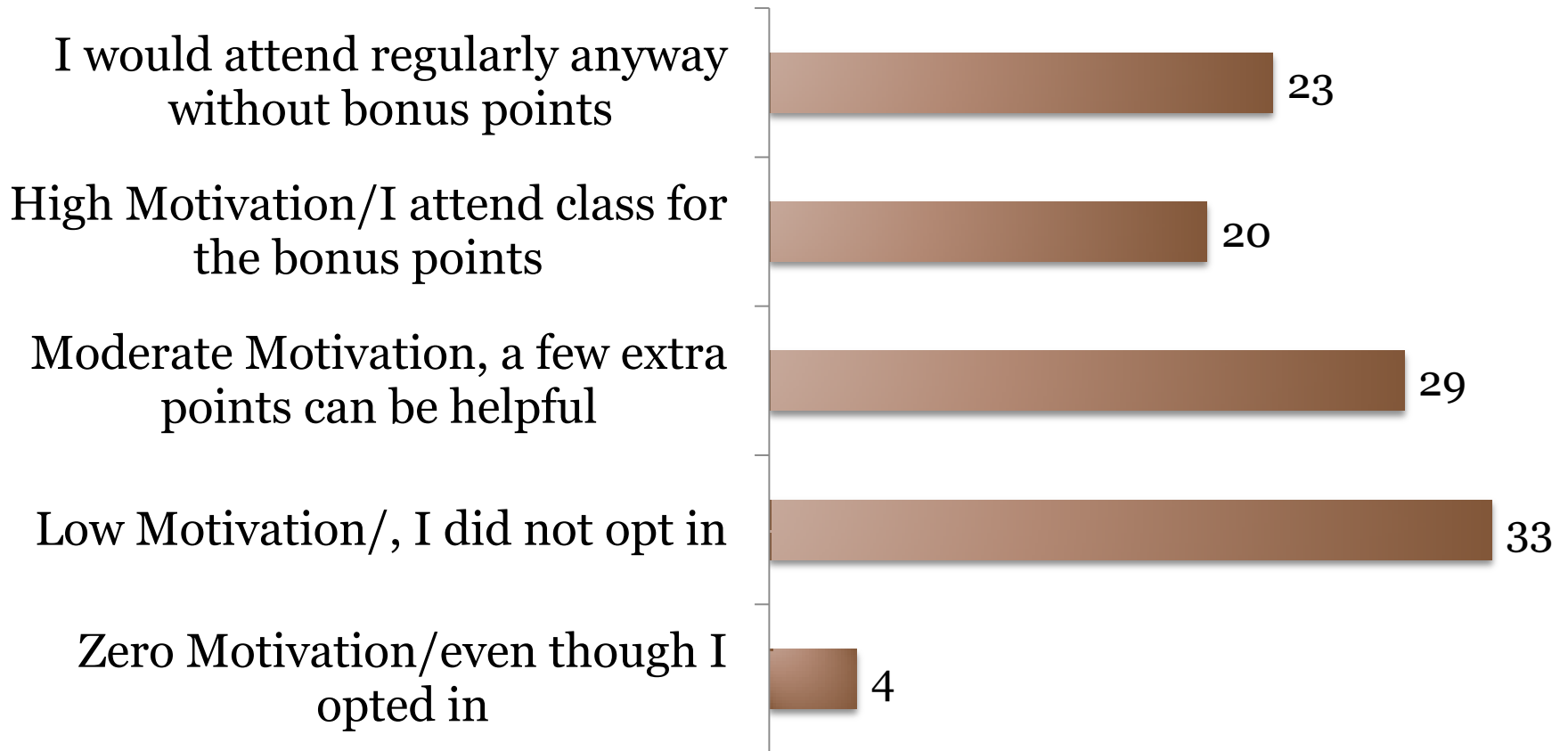
- Do you find Top Hat helps to keep you better engaged in the lectures?
  - **Base Group: No, I do not find it helpful**

## SUMMARY OUTPUT

Regression Statistics			
Adjusted R Square	0.32		
Observations	109		
	Coefficients	t Stat	P-value
Intercept	230.73	11.51	3.35E-20
GPA	36.16	6.56	2.2E-09
Somewhat: keeps me from zoning out	6.65	.50	.62
Yes: helps to keep me interested	6.54	.54	.59
Yes: helps to keep me focused	<b>21.95</b>	<b>1.93</b>	<b>.05</b>
Yes: gives me a deeper understanding	19.77	1.53	.13

# Results: Students' Perceptions

## Were you more motivated to attend class?



# Results: Relationship to Course Grade

- Were you more motivated to attend class?
  - Base Group: I would attend regularly anyway

## SUMMARY OUTPUT

### Regression Statistics

Adjusted R Square

0.32

Observations

109

Intercept

Coefficients

t Stat

P-value

264.99

14.47

1.43E-26

GPA

**34.14**

**6.29**

**7.87E-09**

Zero Motivation: even though I opted-in

-7.76

-0.50

0.62

Low Motivation: I didn't opt-in

**-28.47**

**-3.55**

**0.00**

Mod. Motivation: a few bonus pts. help

-9.20

-1.12

0.26

High Motivation: I attend class to get pts.

-13.82

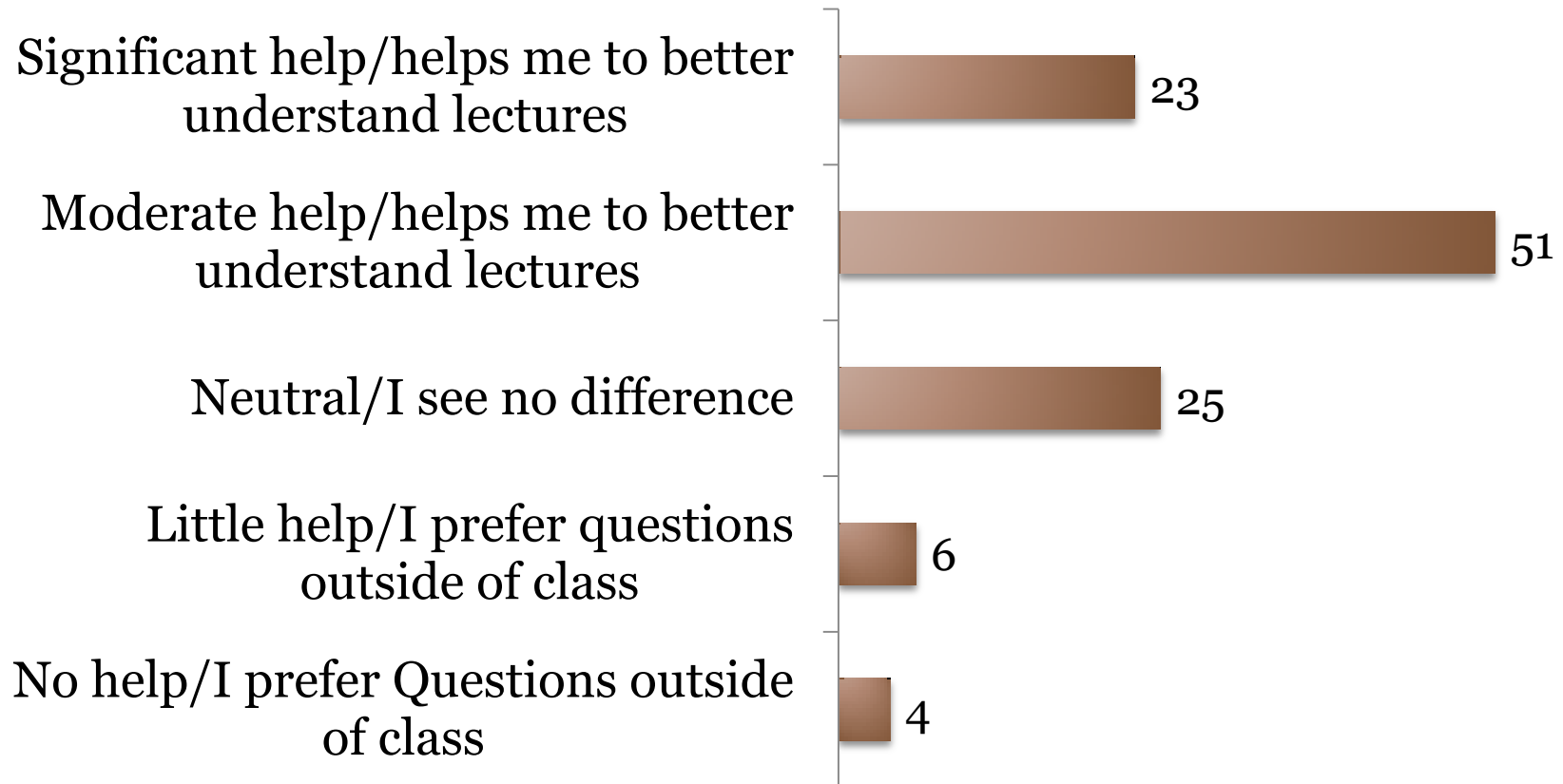
-1.54

0.13



# Results: Students' Perceptions

**Do you find TH helps you to better understand the material as opposed to questions given outside the classroom.**



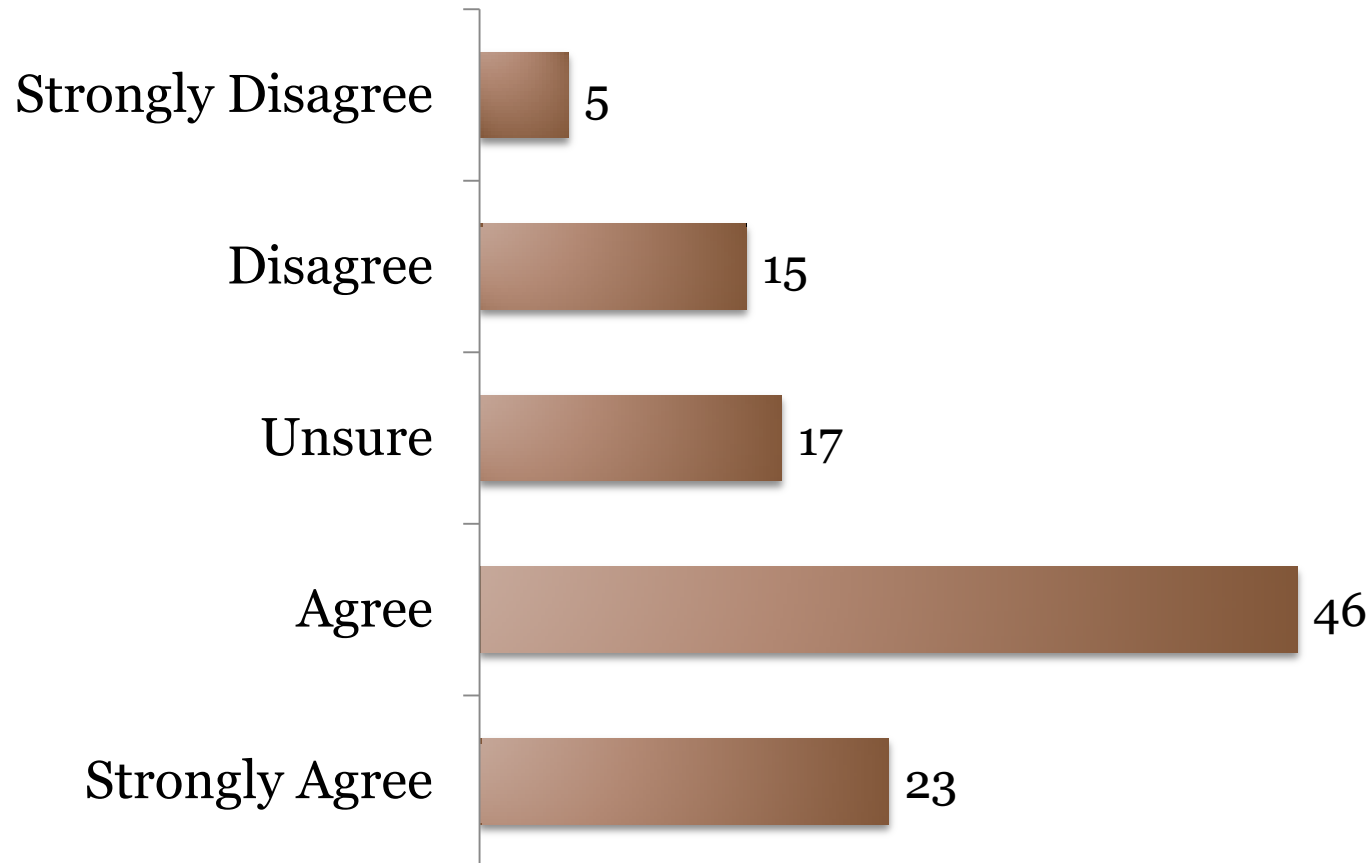
# Results: Relationship to Course Grade

- Do you find THM helps you to better understand the material as opposed to questions outside of the classroom
  - **Base Group: It significantly helps me to better understand lectures**

SUMMARY OUTPUT			
Regression Statistics			
Adjusted R Square	.34		
Observations	109		
	Coefficients	t Stat	P-value
Intercept	255.44	15.13	6.45E-28
GPA	36.80	6.74	9.32E-10
No Help: prefer Q's given outside of class	<b>-42.33</b>	<b>-2.67</b>	<b>.01</b>
Little Help: prefer Q's given outside of class	-21.69	-1.61	.11
Neutral: I see no difference	<b>-21.36</b>	<b>-2.53</b>	<b>.01</b>
Mod. Help: helps to better understand lectures	-9.82	-1.32	.12

# Results: Students' Perceptions

## Top Hat Improved My Understanding of the Course Material



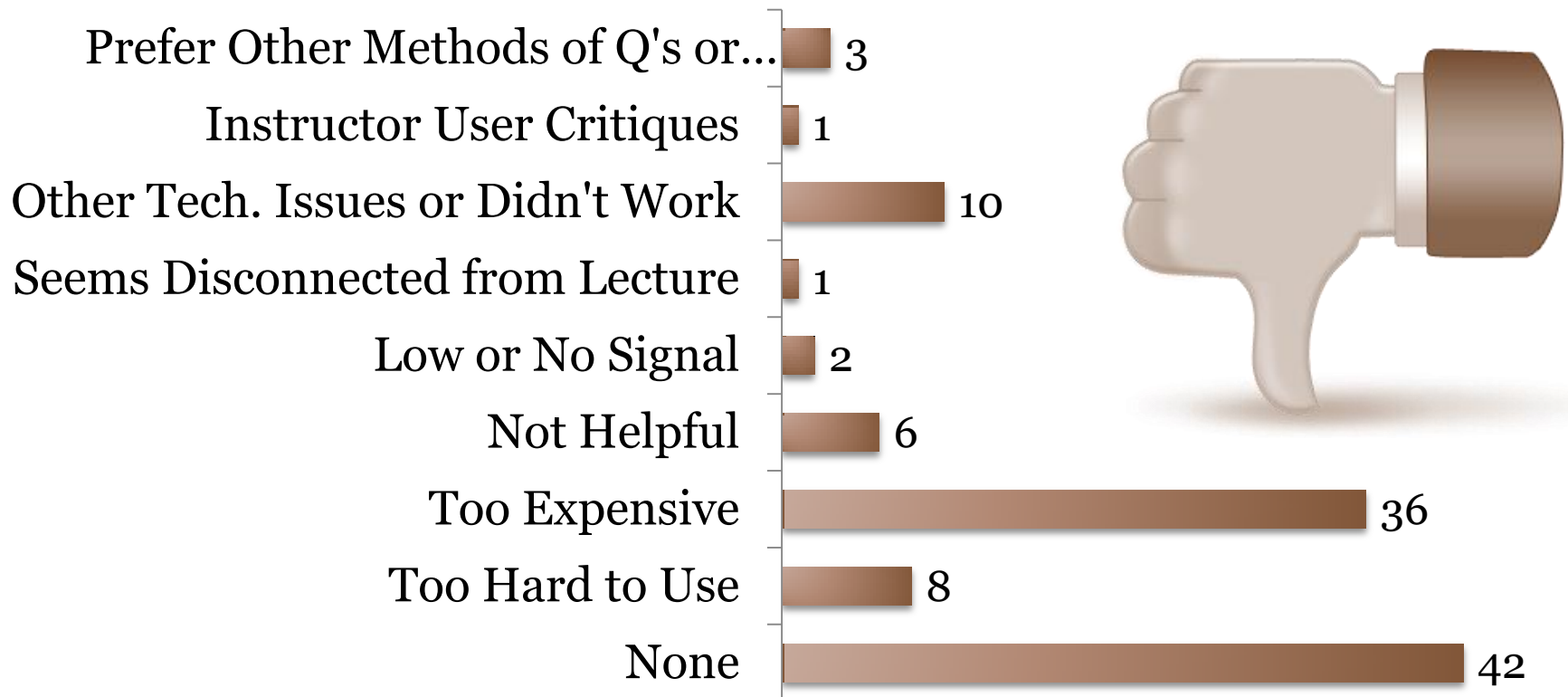
# Results: Relationship to Course Grade

- Top Hat Improved My Understanding of the Course Material
  - Base Group: Strongly Disagree

SUMMARY OUTPUT			
Regression Statistics			
Adjusted R Square	0.34		
Observations	75		
	Coefficients	t Stat	P-value
Intercept	203.29	7.48	1.96E-10
GPA	<b>35.17</b>	<b>5.90</b>	<b>1.28E-07</b>
Top Hat	0.19	1.27	0.21
Strongly Agree	<b>42.38</b>	<b>2.01</b>	<b>0.04</b>
Agree	<b>41.48</b>	<b>2.02</b>	<b>0.04</b>
Unsure	34.47	1.64	0.10
Disagree	28.44	1.30	0.20

# Results

## Is There Anything That You Dislike About the System?



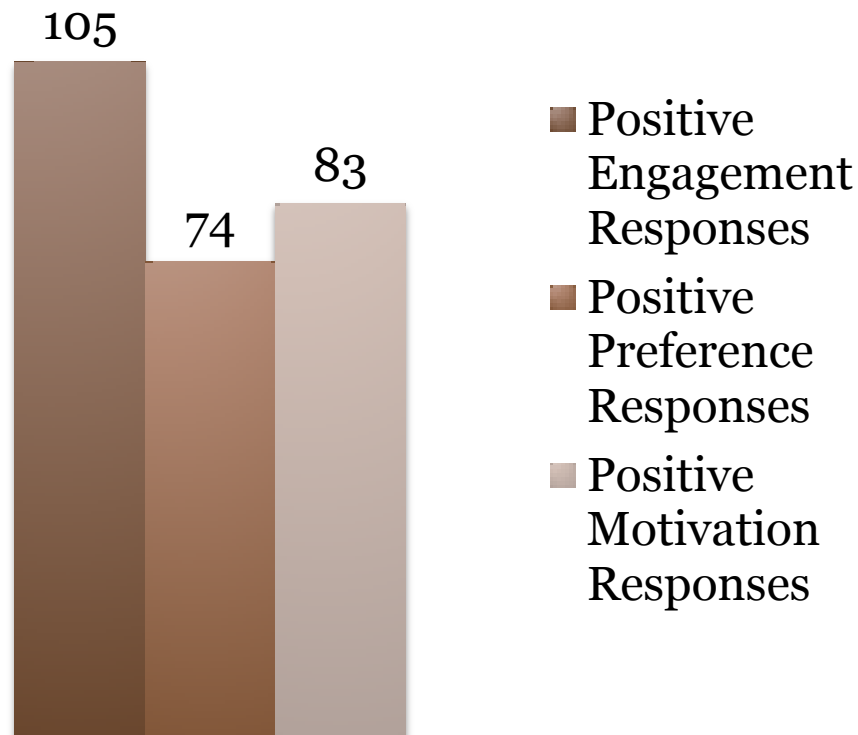
# To Answer Our Question....

Does Web-based  
Student Response  
Systems help  
students to learn  
more?



# Conclusion

- It brings technology to the classroom to engage “technology driven” students



# Conclusion (cont'd)

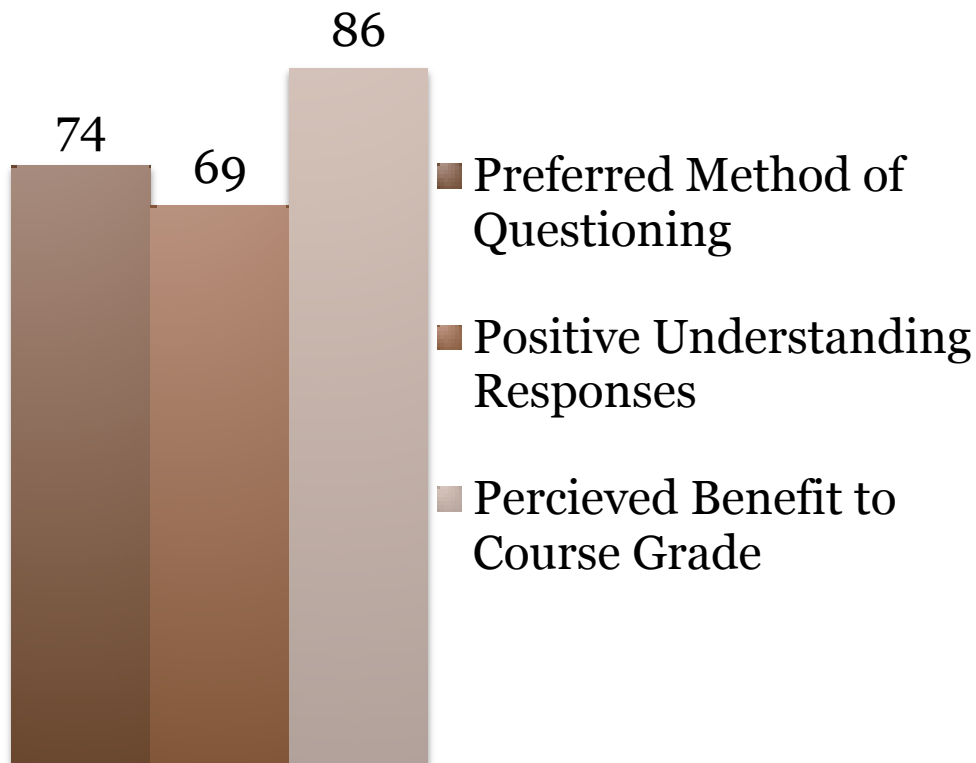
- Students used the system differently, which caters to different learning styles
  - In-class Questions
  - Out of class Questions
  - Digital Discussions
  - Notes
  - Lecture materials
  - Gaming





## Conclusion (cont'd)

- Students preferred the in-class method of questioning and their understanding of material increased



# Questions?

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