

# The Effect of WebAssign in an Introductory Astronomy Course

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# Question:

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- How does the use of WebAssign for homework assignments compare to no graded homework?
- Previous work\* shows little difference between WebAssign and paper homework

\* *Scott Bonham, Robert Beichner, Duane Deardorff, "Online homework: Does It Make a Difference?" The Physics Teacher May 2001*



# “help” in what way?

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- Does WebAssign improve conceptual understanding?
- Does it improve opinion of the course?
- Does it improve test scores?



# Methods

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- 4 sections of introductory astronomy (for non-science majors)
- 3 different instructors
- compare test scores
- compare Astronomy Diagnostic Test (ADT) gains
- use mid-course survey



# Course Details

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- Traditional Lecture format
- 30 - 80 students per section
- Little focus on problems with math
- presentation using powerpoint
- multiple-choice tests



# Section Details

Section 1 - Instructor A	Used WebAssign for Homework
Section 2 - Instructor A	Assigned Homework, but not graded
Section 3 - Instructor B	WebAssign for first half, then research paper
Section 4 - Instructor C	Research paper for first half, then used WebAssign



# Homework Details

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- Questions were mostly multiple-choice and multiple select
- Students were given a “score” feedback, but not item details
- Non-WebAssign sections were given the same homework (posted) but not graded



# Population comparison

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- Looked at:
  - ADT pre-scores
  - ADT confidence level
  - ADT science and math levels (self reported)
  - ADT expected difficulty
- No significant differences



# ADT gains (matched)

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Section 1 (WebAssign)	35	4.7%
Section 2 (No WebAssign)	50	8.6%
Section 3 (WebA then Paper)	51	5.4%
Section 4 (Paper then WebA)	27	14.8%



# Comparing Test scores for Instructor A

	WebA avg	non-WebA avg	Z-score
Test 1	56.8%	60.1%	1.58
Test 2	60.0%	63.3%	1.31
Test 3	66.3%	63.5%	-1.06
Test 4	61.6%	60.9%	-.019
Final	77.1%	76.4%	-.029



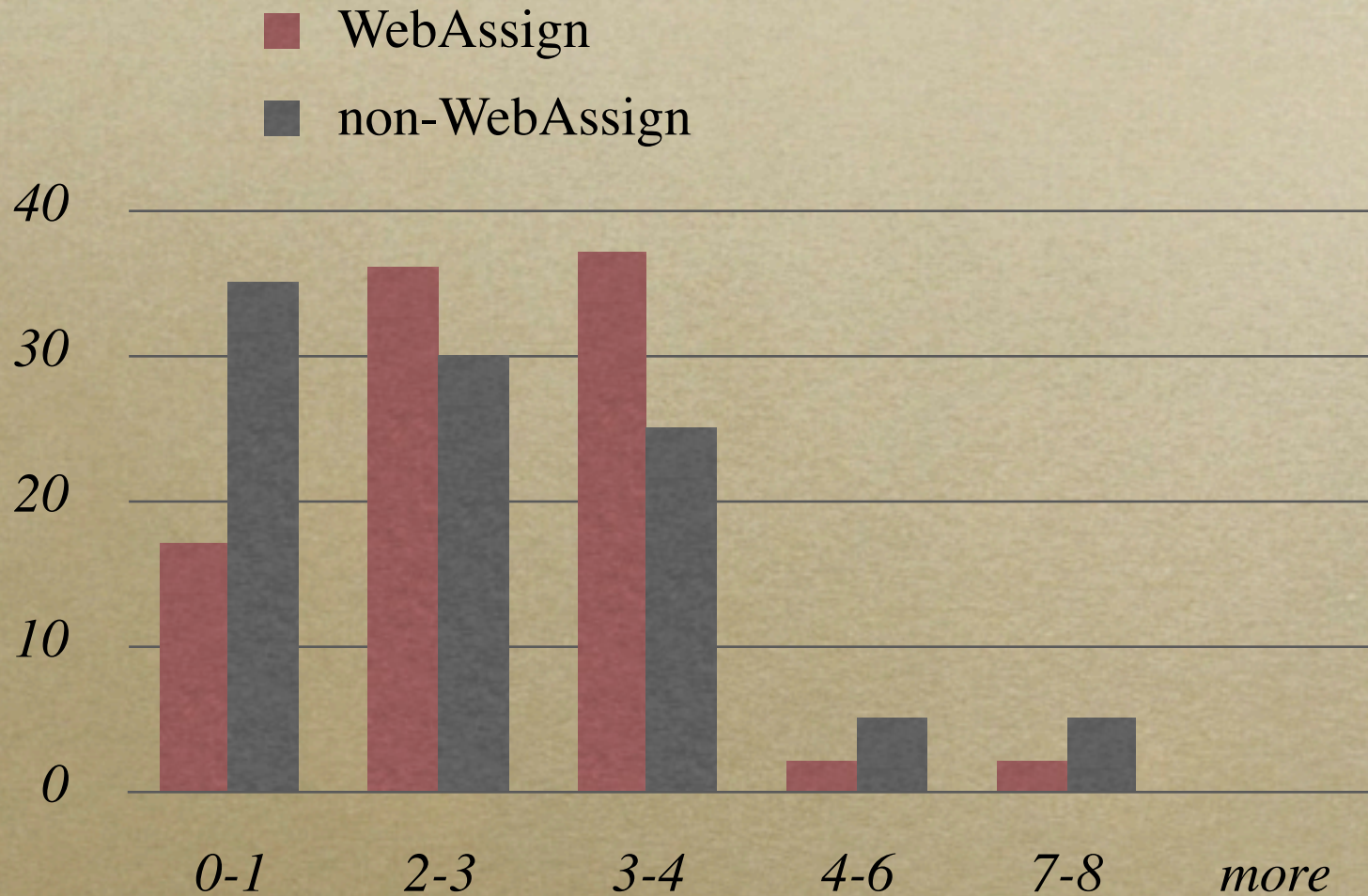
# Survey

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- *Mid-course survey given to Sections 3 and 4*
- *This is at the “switching point”*
- *Section 3 has been using WebAssign and Section 4 has not*

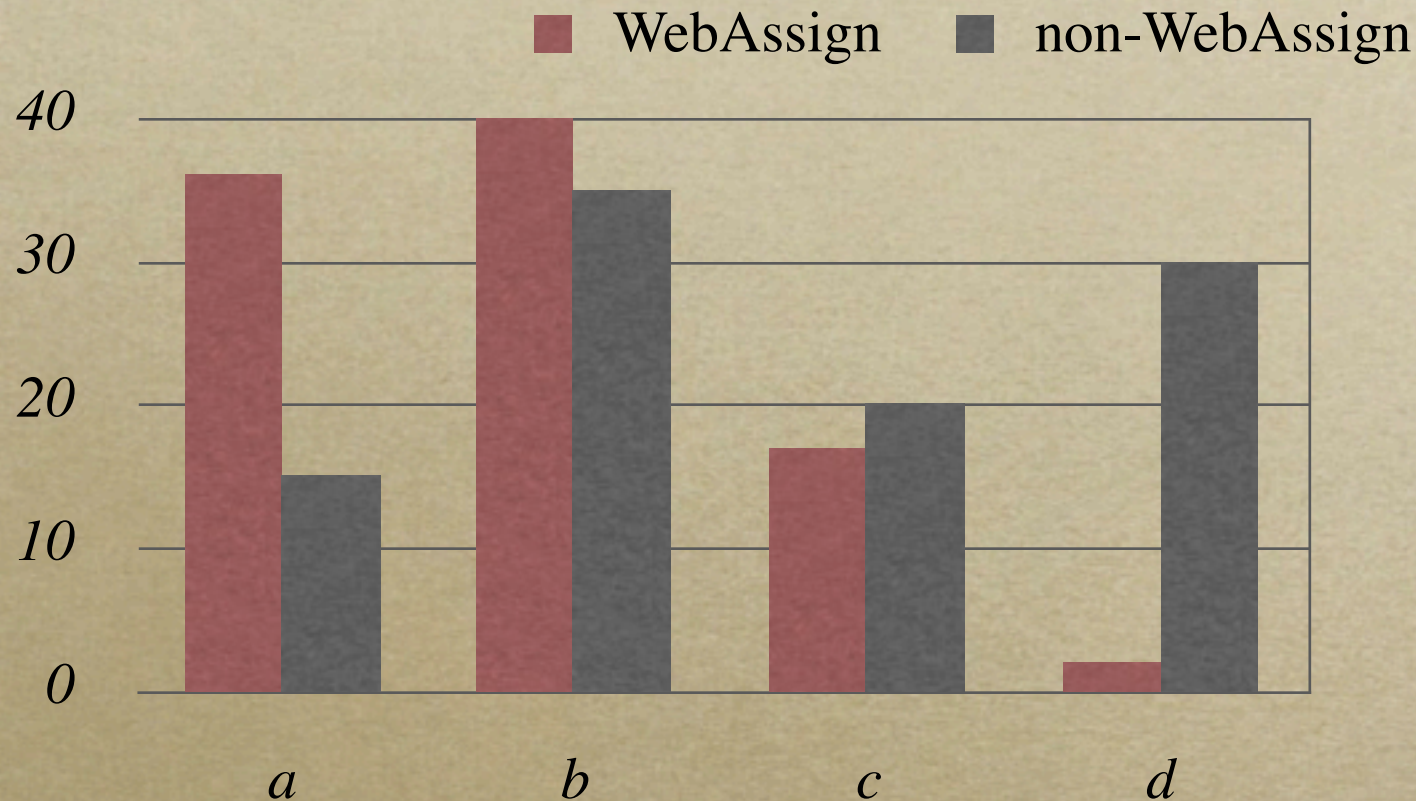


# How much time do you spend outside of class?





# How do you use the homework?



*a - looked up answer in text*

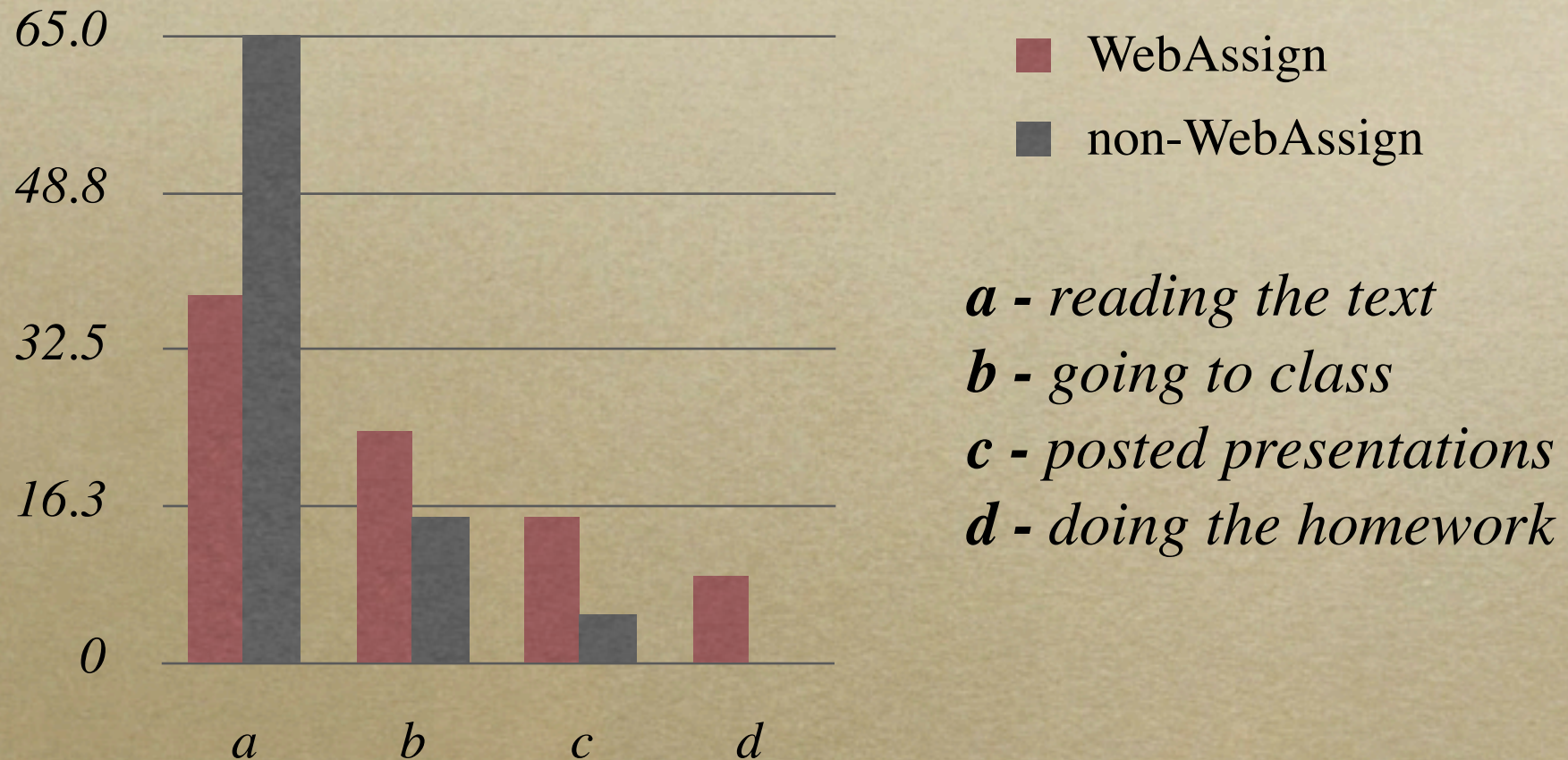
*b - used it as practice*

*c - to determine where I was confused*

*d - I did not look at HW*



# What helped you the most in this course?





# Limitations

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- This study used:
  - non-science majors
  - mainly multiple-choice questions
  - many recall questions
  - no problem solving
  - few calculations



# Conclusions

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- Overall, it seems WebAssign had little change on students in Introductory Astronomy courses
- In this case, WebAssign may be similar to paper homework