

# WHAT GOES ON IN GROUP EXAMS?

EXPLORING GROUP DYNAMICS IN TWO-STAGE  
COLLABORATIVE GROUP EXAMS

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Special thanks to the Phys 117 and Phys 101 classes

# Outline

- Background and Scientific Motivation
- Methodology
- Aims/Hypotheses
- Results
- Limitations/Future work
- Conclusion

# Motivation

Collaboration and problem solving are important aspects of Physics.

Group exams shown to improve Physics problem solving.

Improve group examination for weaker students.

Insight into group dynamics can lead to improvements in formation of groups.

# Testing Methodology

**IMMEDIATE FEEDBACK ASSESSMENT TECHNIQUE**  
Name \_\_\_\_\_  
Subject \_\_\_\_\_  
**SCRATCH OFF COVERING TO EXPOSE**

|    | A                        | B                                   | C                                   | D                        | E                                   |
|----|--------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |
| 2. | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 4. | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 5. | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |
| 6. | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |

Figure 1: An example answer sheet for the group exam. A star signifies the correct answer, students get multiple attempts.

# Participation Rubric

- 4 – Student plays an active role in discussions by attempting to solve the problem, offering possible explanations to queries and going through calculations.
- 3 – Student engages with peers and attempts to follow arguments made. Offers a solution to the problem at hand.
- 2 – Student engages in a limited fashion with peers. Attempts to follow and understand the discussion.
- 1 – Student shows intermittent focus and offers no input to the discussion.
- 0 – Student does not interact with peers in any fashion.

# Aims

To determine the efficacy and mechanics of an instant-feedback system.

To explore the different conditions that increase or decrease participation.

To determine what conditions lead to higher engagement in lower performing students.

# Hypotheses

Getting a question wrong would lead to increased participation by all members.

Higher performing students will be more engaged in discussions, while lower performing students will be more reticent to participate.

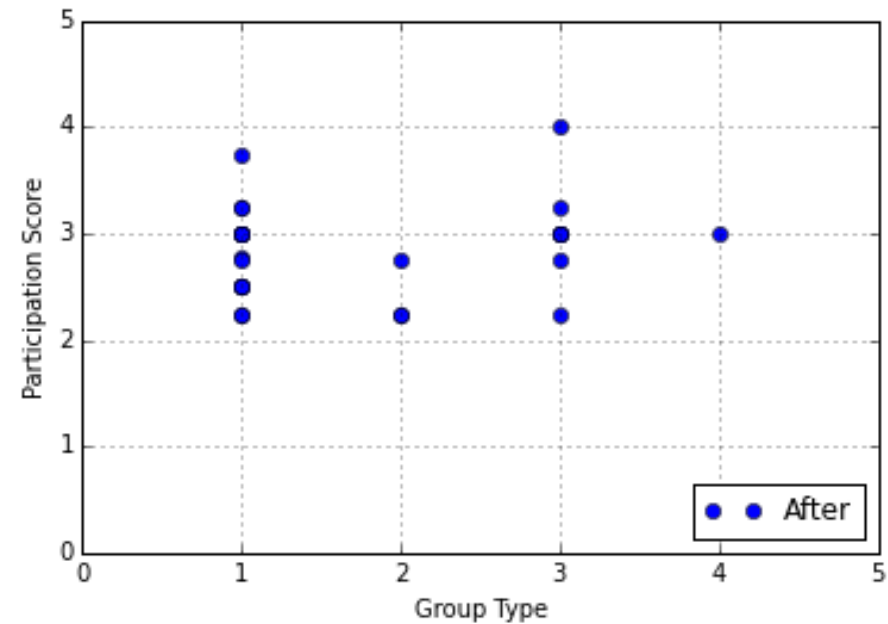
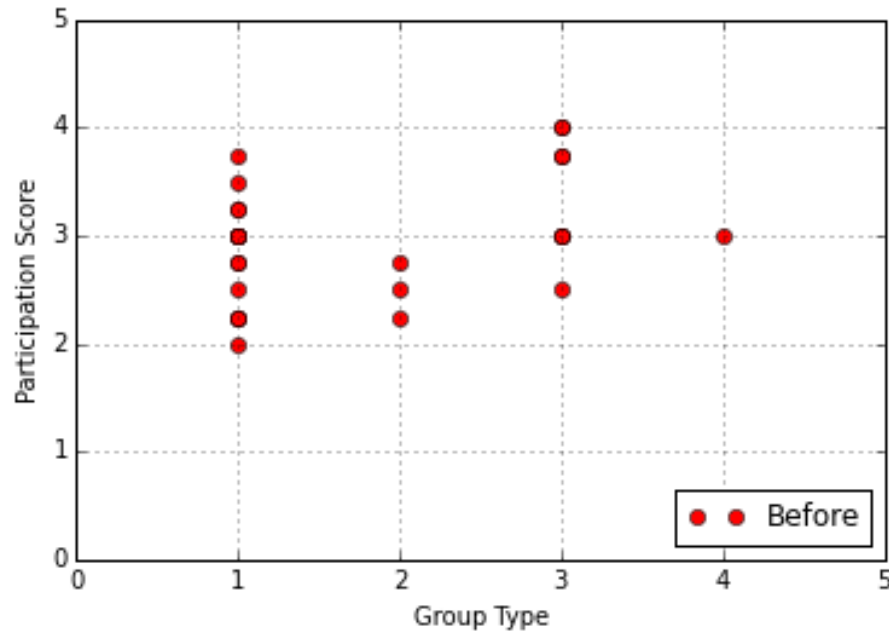
Lower performing students will participate more in a group with students around their level, versus a group with all high performing students.

# Defining Group Types

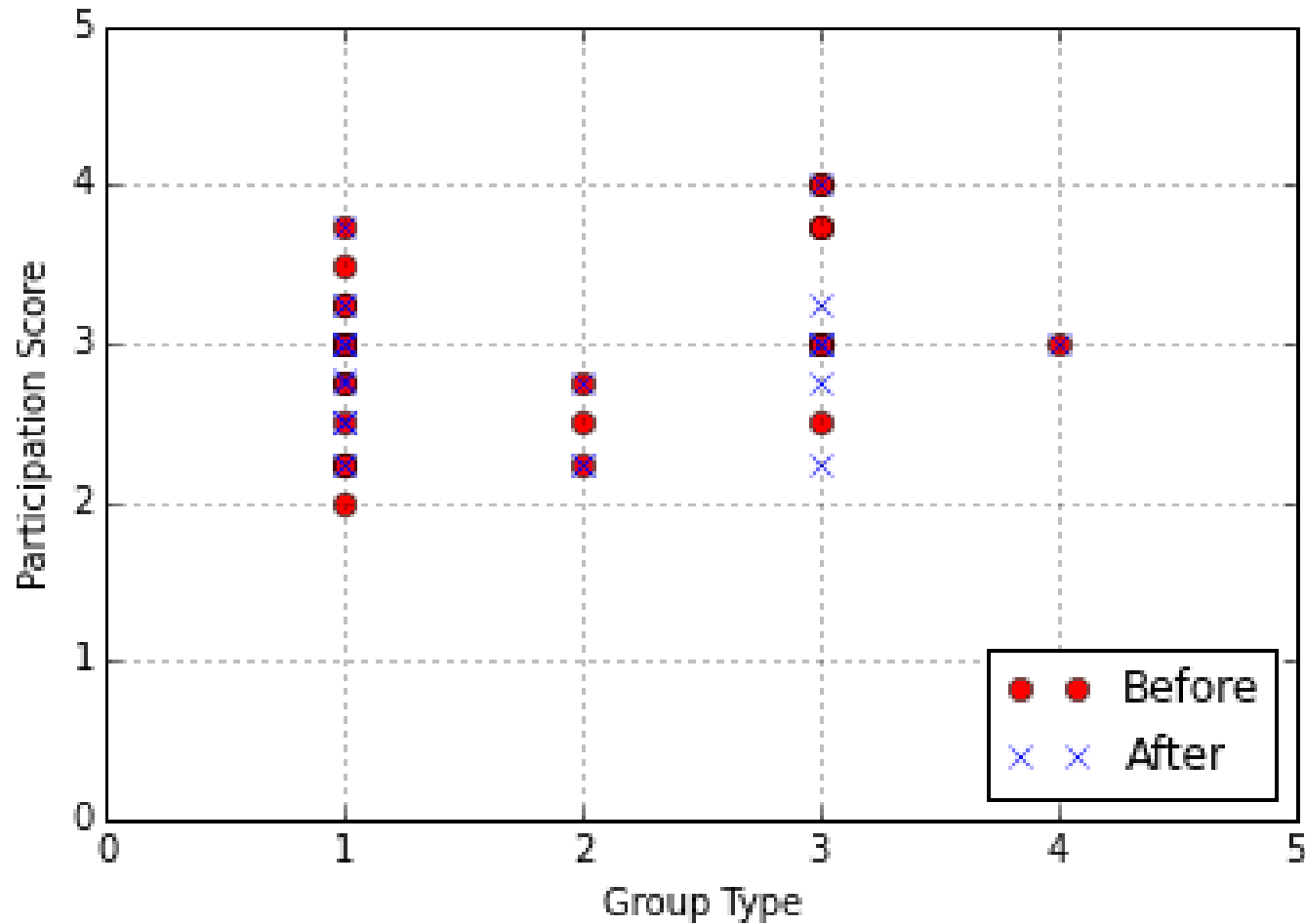
- Type 1: One high performer amongst lower performing students.
- Type 2: One low performer amongst higher performing students
- Type 3: Spread over all abilities
- Type 4: Homogeneous group



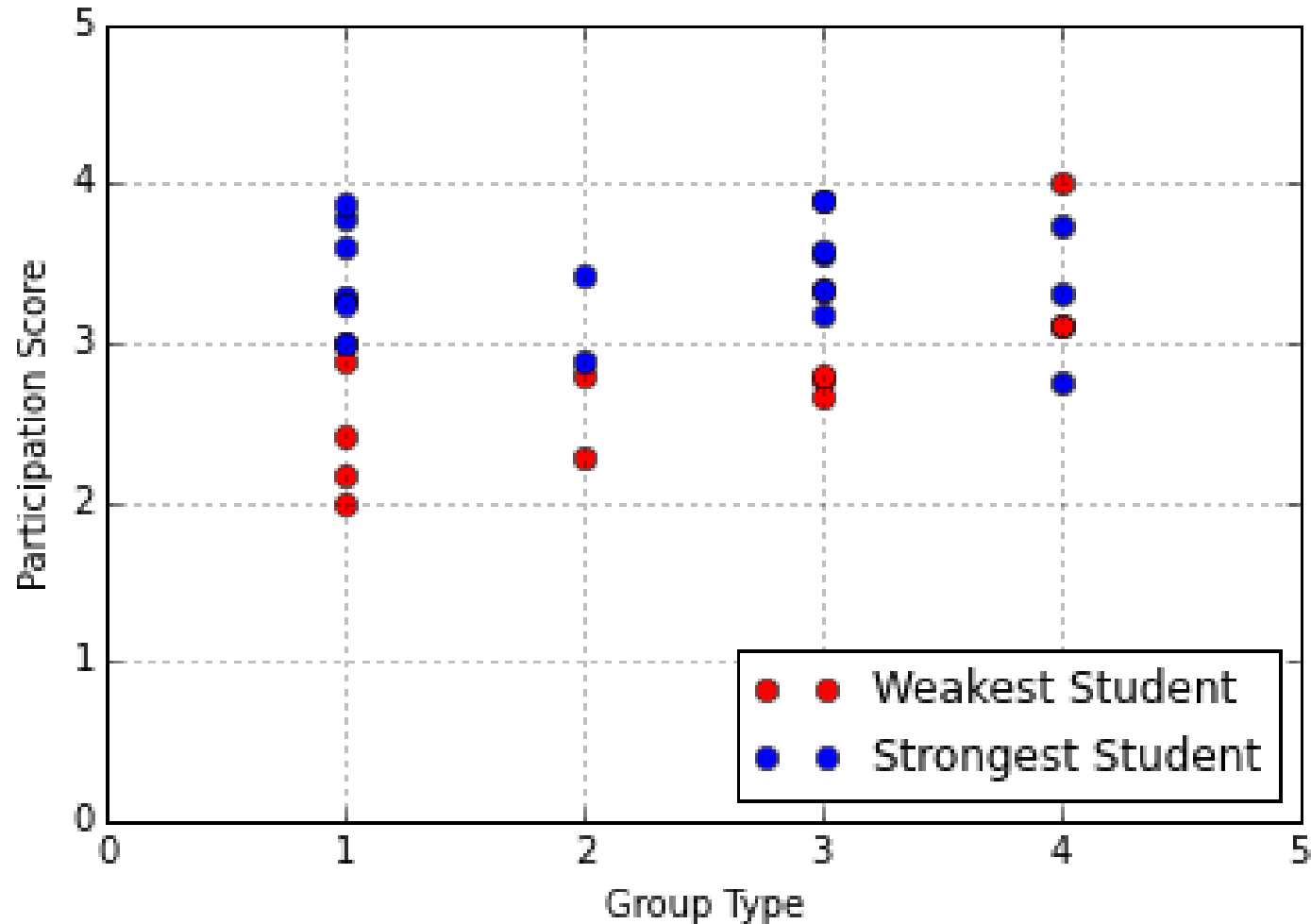
Does getting a question wrong lead to increased participation by all members?



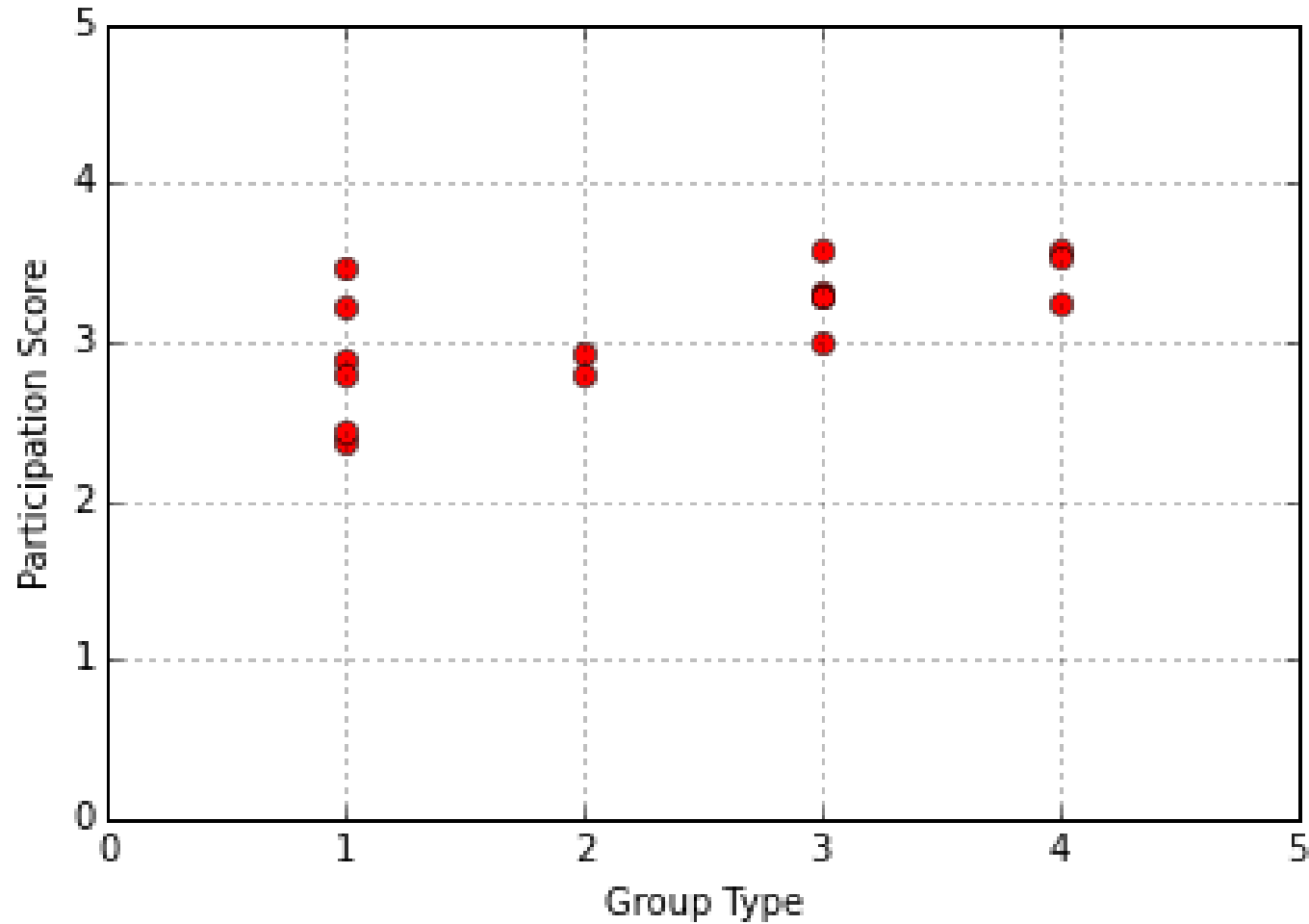
Does getting a question wrong lead to increased participation by all members? INCONCLUSIVE



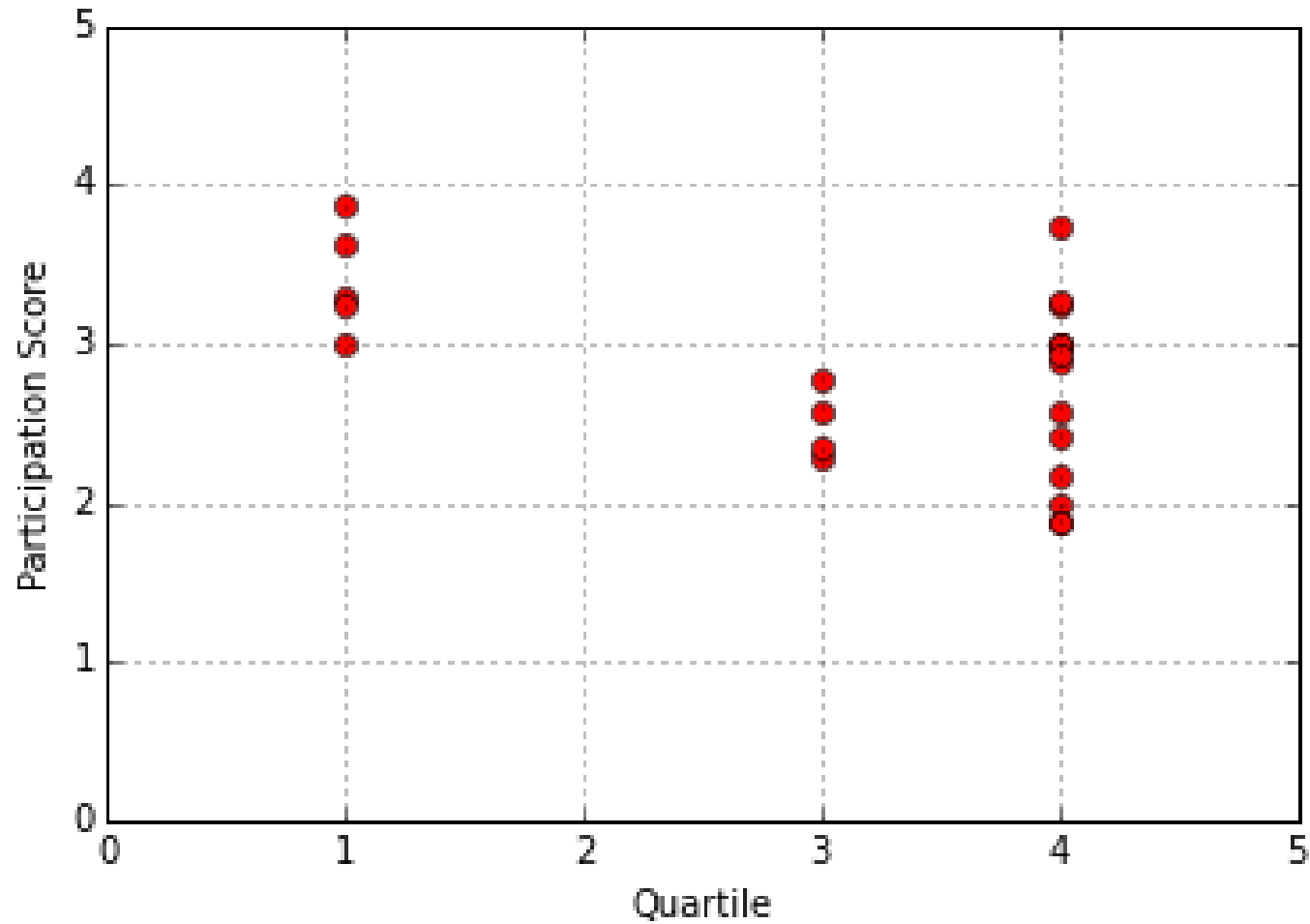
Do higher performing students participate more than lower performing students?



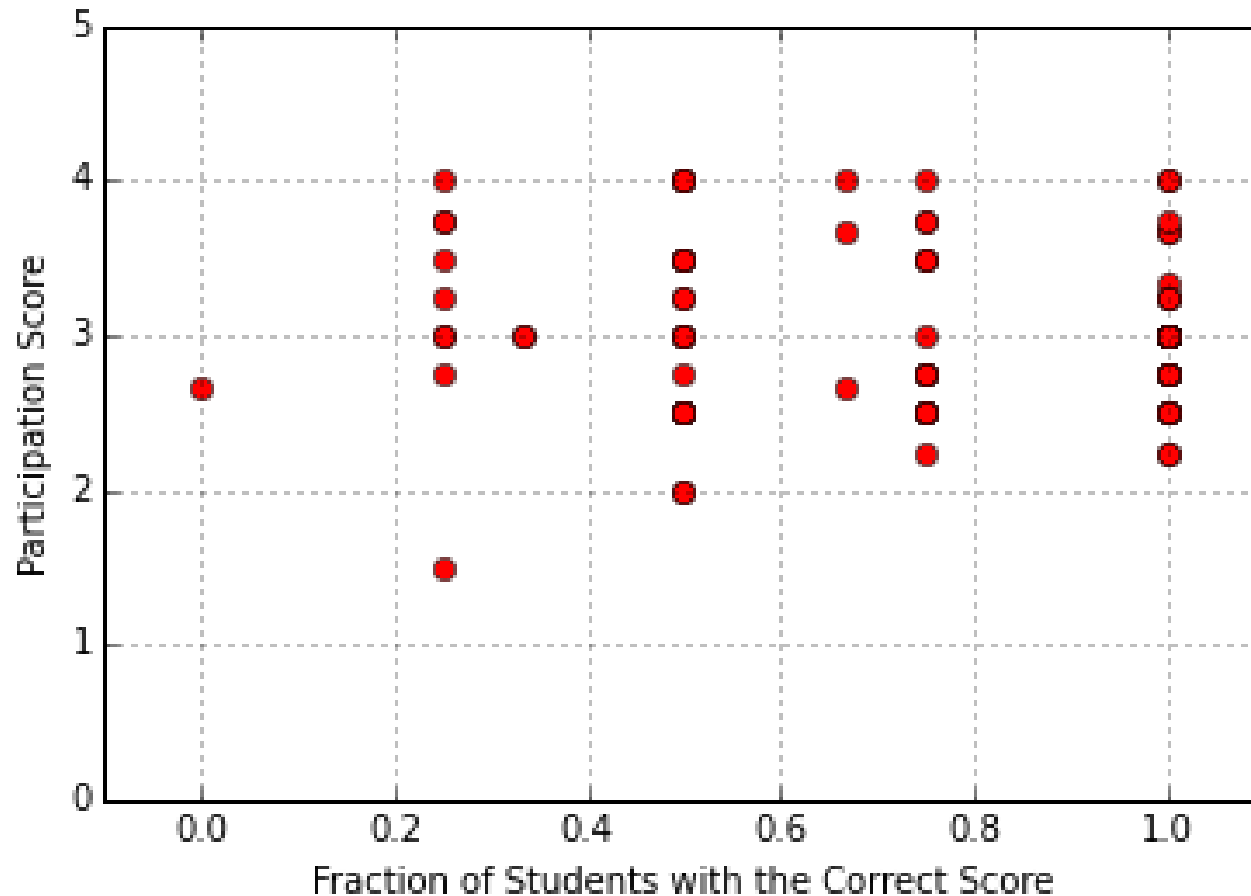
# Group Participation vs Group Type



# Type 1 Group



Does performance on the individual question translate to participation?



# Future Work

Integrate the rest of the Phys 101 data.

More detailed analysis of group types under different conditions. (e.g. participation vs student ability, thorough breakdown of each particular group type)

Explore different conditions for weakest students. (e.g. performance on similar question type vs participation)

# Limitations

Lack of data for all group types.

Small data sample (6 tests for Phys 117, 2 tests for Phys 101)



## Conclusion: What does this mean for group exams?

- Explored the dynamics of different groups in an exam setting.
- Analyzed different conditions that affect participation.
  
- Homogeneous groups appear to be the best types of groups.
- Participation not dependent on performance on a similar question type.