

# Innovative evaluation techniques for students of health professions programs:

## GROUP TESTING

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## Premise

- Traditional testing is pedagogically unsound since most learning is assisted and promoted by the efforts of a wide variety of individuals.
- Constructivist theory:
  - Learner actively constructs knowledge.
- Social constructivism:
  - Knowledge creation is shared experience.
- Individual testing followed by group testing is formative:
  - Informs and improves on performance.

# Expectations

- Students will be more engaged in learning.
- Group skills will improve:
  - Teamwork, responsibility, respect, communication, conflict management.
- Students will experience less test anxiety:
  - Will offer and receive support and comfort from group members.
  - Self-confidence.
- Academic performance will improve.
- Student satisfaction will improve.

# Hypothesis

- All students will benefit from collaborative group testing.
- Objectives:
  - Observe student interactions during group testing.
  - Determine effect of group testing on the test performance of high- and low-performing students.
  - Determine proportion of students who increased, decreased, or had no change in individual test scores with group testing.
  - Record student opinions of group testing method.

## Things to consider

- Test format and length
- Group size
- Group members
- Calculation of test grade

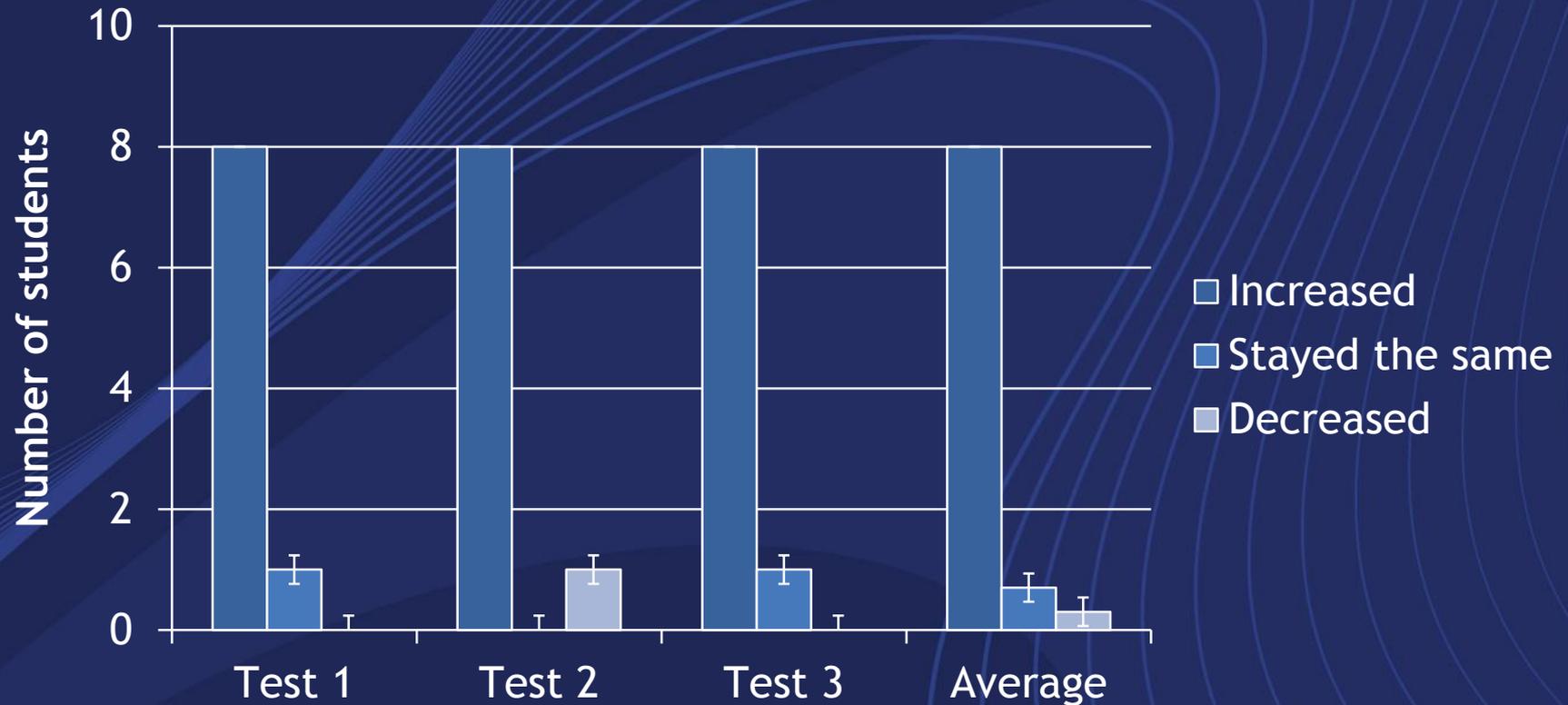
## Methodology

- 4 nuclear medicine courses, 2 per semester.
- Traditional multiple choice test:
  - 30-50 questions, 45-60 minutes.
- Group test:
  - 4/5 students per group.
  - Group member selection - by instructor/counting off/by student.
  - Immediately after completion of individual tests.
- Class feedback after group test.
- Calculation of test grade:
  - Ratio individual:group test = 60:40 - 80:20.
- Student opinions solicited at end of second semester.
- Individual and group test scores collected and compared:
  - Higher, lower, same as individual test score.

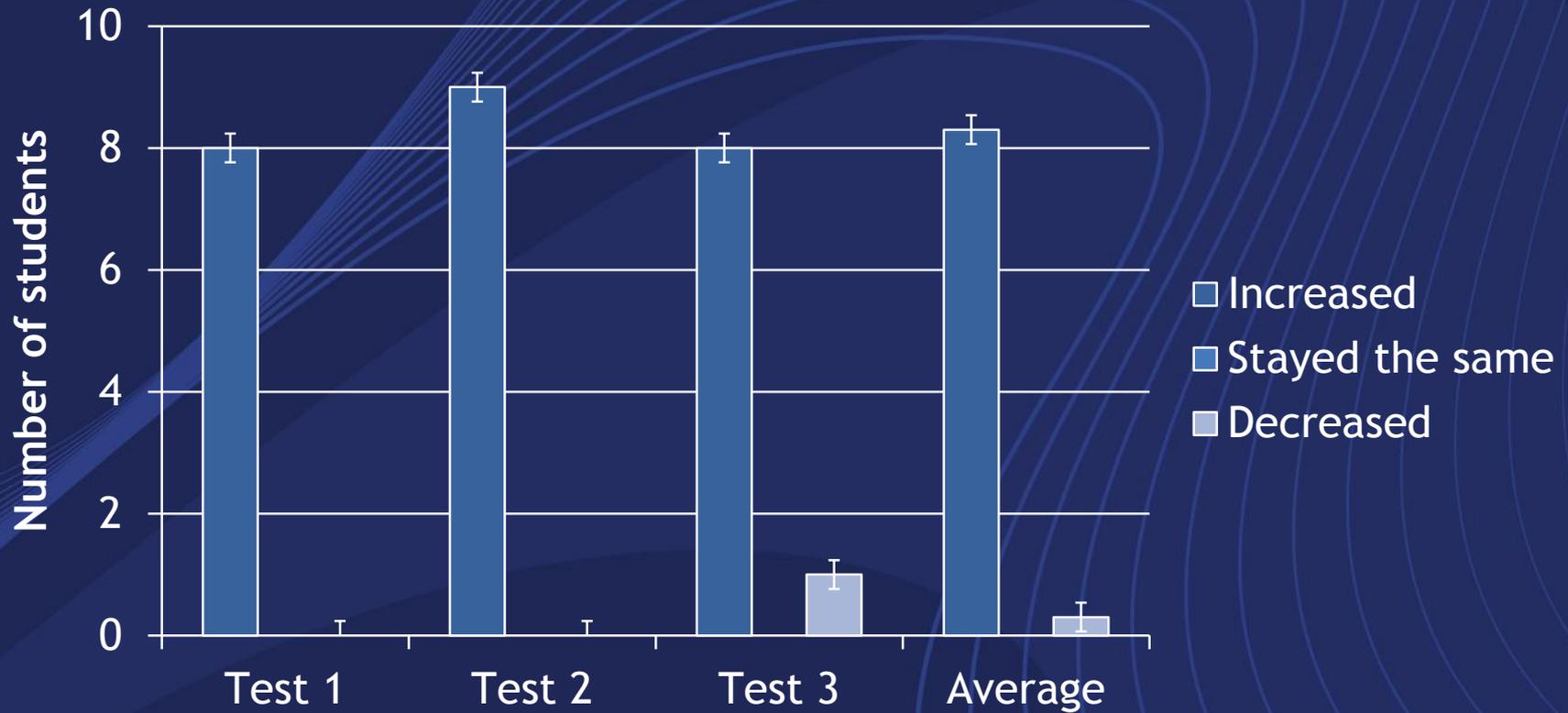
## Results

- Average test performance:
  - 14 tests
  - 88% of students' grades increased.
  - 6% of students' grades stayed the same.
  - 6% of students' grades decreased.

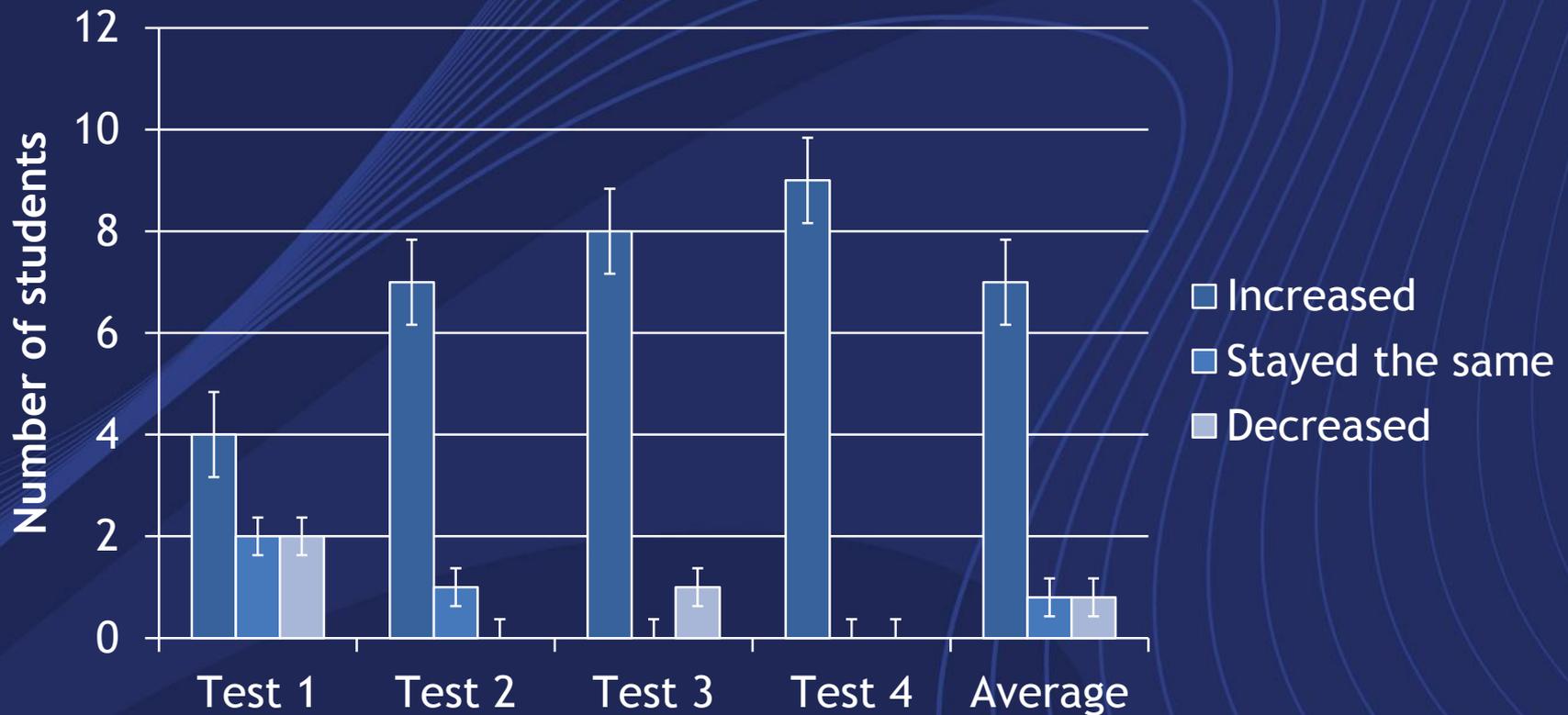
# Number of students changing test score RSN 455



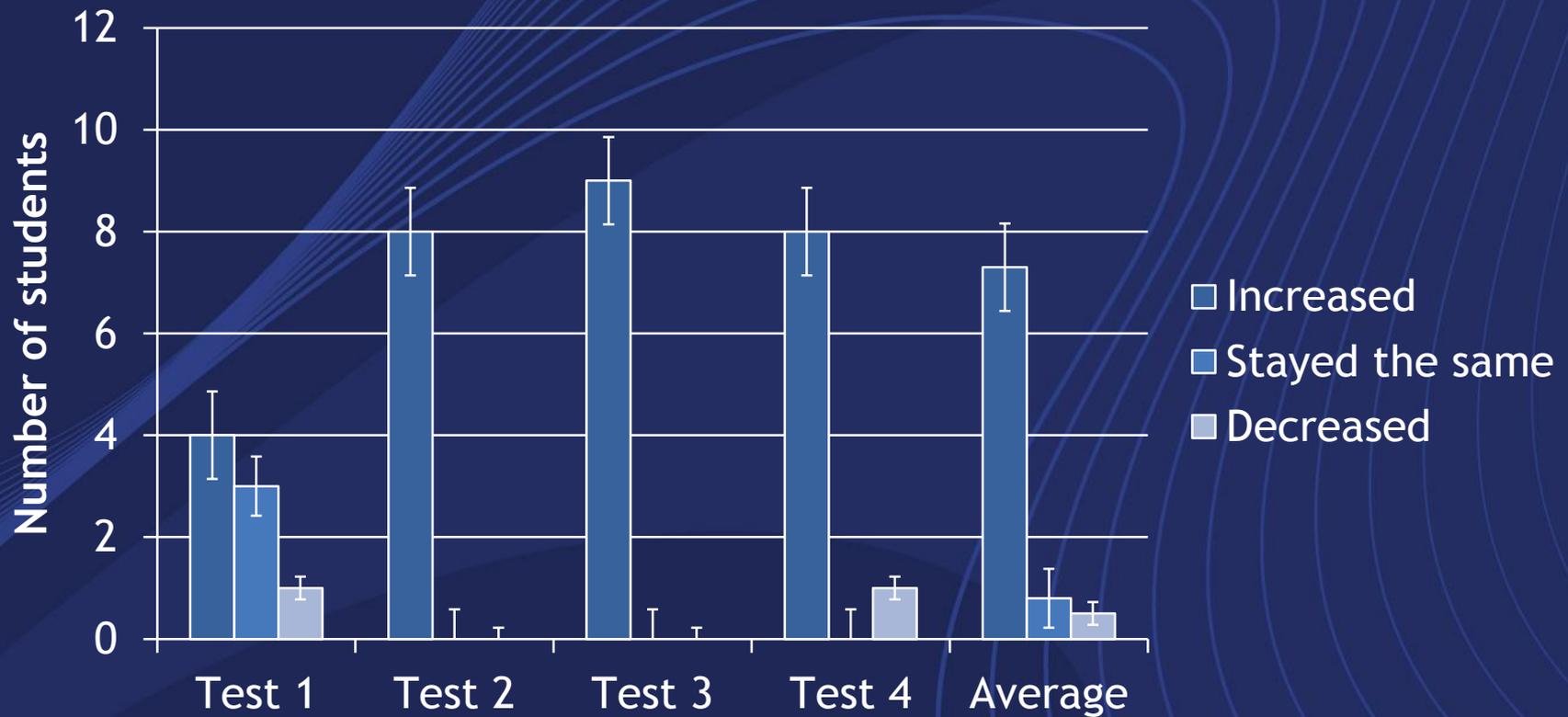
# Number of students changing test score RSN 420



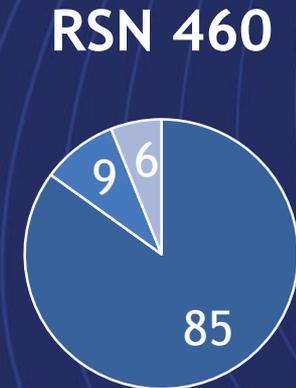
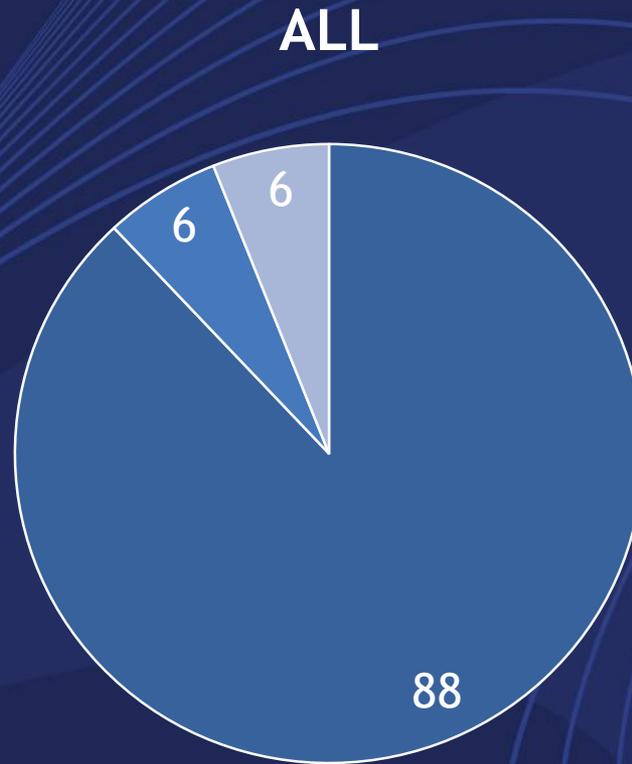
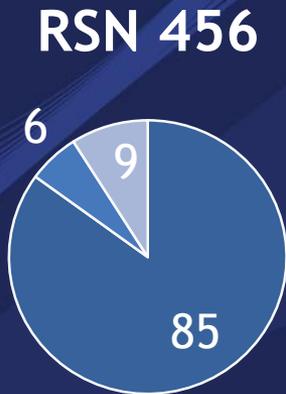
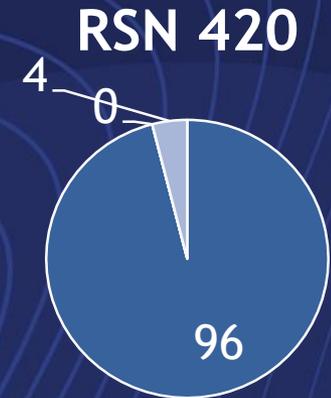
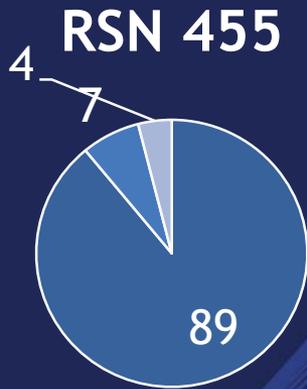
# Number of students changing test score RSN 456



# Number of students changing test score RSN 460



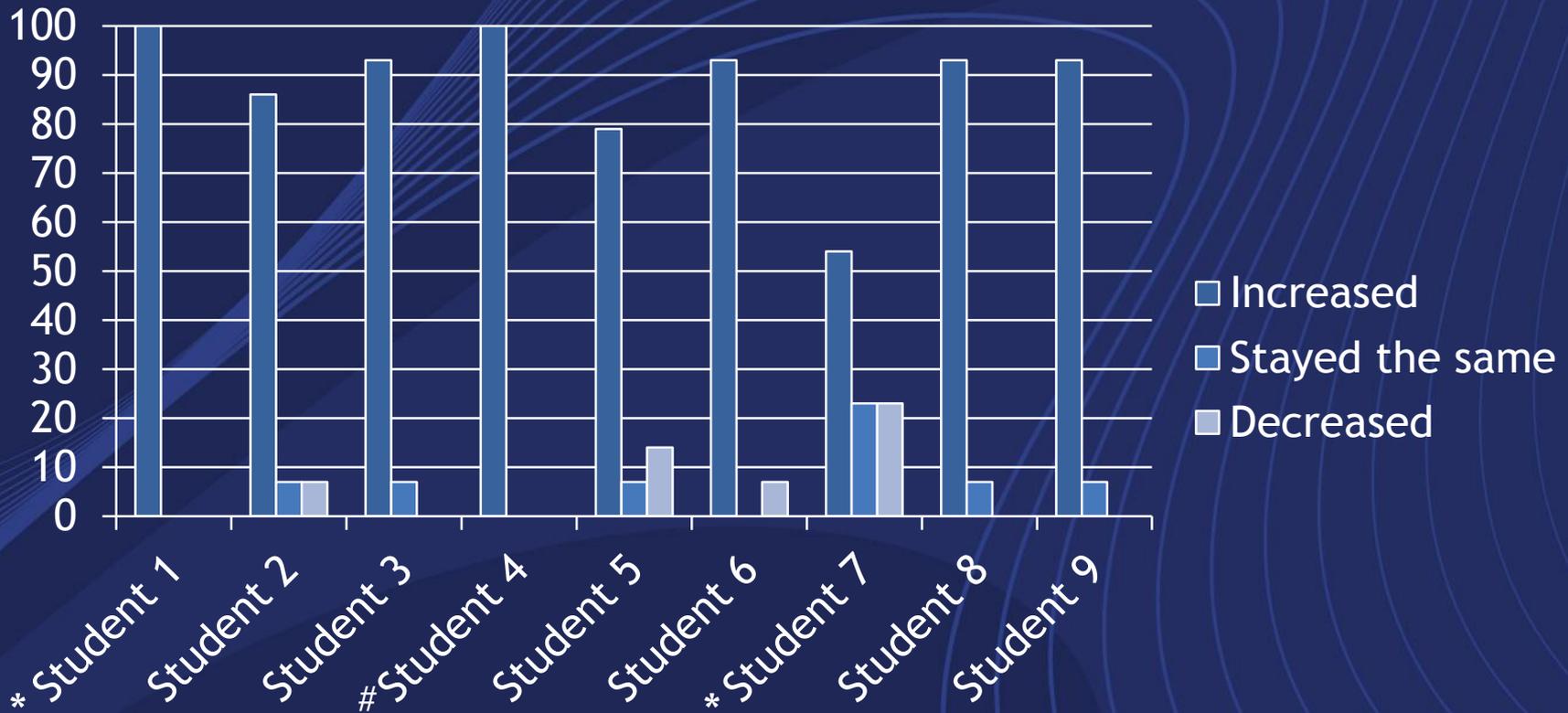
# Overall incidence of change in test score



■ Increased   
 ■ Stayed the same   
 ■ Decreased

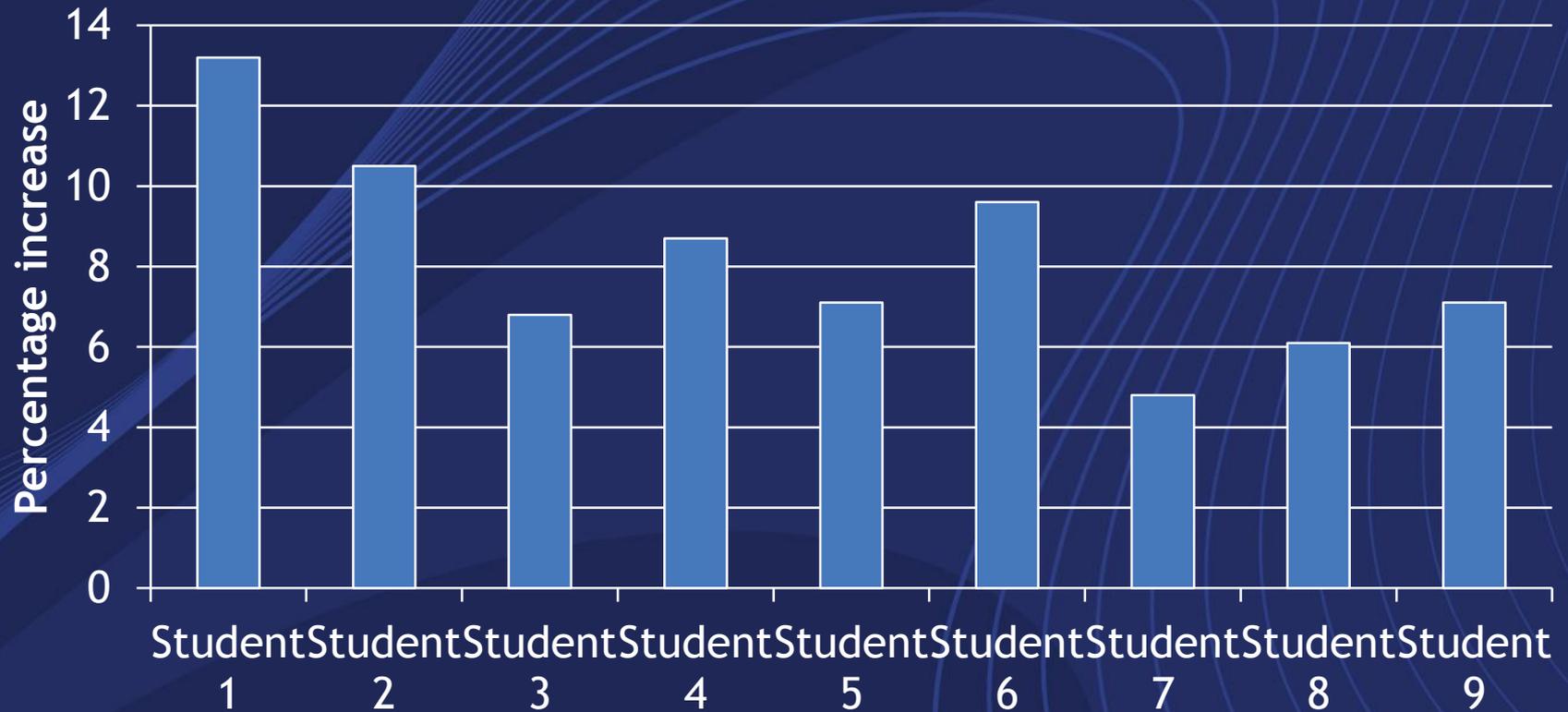
- All students increased their scores 50-100% of the time.
- 8 students increased their scores 80-100% of the time.
- 6 students scores stayed the same 5-20% of the time.
- 4 students' scores decreased 5-20% of the time.
- The highest performer in the class increased her score 50% of the time.
- The 2 poorest performers in the class increased their scores 100% of the time.

# Individual student's percentage of test scores that increased, stayed the same, or decreased



All students took 14 tests, except \* (13 tests) and # (11 tests).

## Individual students' average score increase



- All students agreed or strongly agreed that group testing increased their course grades.
- 8 students agreed or strongly agreed that they understood course material better because of group testing. 1 student was neutral.
- All students disagreed or strongly disagreed that group testing meant they did not have to study so much.
- All students disagreed or strongly disagreed that group testing negated the need for individual testing.
- 8 students were satisfied with the way groups were assigned. 1 student was neutral.
- 5 students thought that instructors should always assign the students to the groups. 2 students disagreed and 2 were neutral.

- 8 students agreed or strongly agreed that students in their groups had participated equally. 1 student was neutral.
- 5 students strongly agreed that the group members were responsible for speaking up if a group member was not actively participating. 2 students disagreed and 2 were neutral.
- 6 students disagreed or strongly disagreed with statements that group testing was unfair and that they should not have to help other students. 1 student agreed with the statements and 2 students were neutral.
- All students would like other instructors to use group testing.

Question	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree	Mean
1. I believe my course grade is higher because of group testing.	-	-	-	3	6	4.7
2. I believe my level of understanding of test material is higher because of group testing.	-	-	1	3	5	4.4
3. Because of group testing, I do not have to study so much before a test.	7	2	-	-	-	1.2
4. If we do a group test, we do not need to do an individual test as well.	8	1	-	-	-	1.1
5. I am satisfied with the way groups are assigned.	-	-	1	2	6	4.6
6. The instructor should always assign the students to the groups.	2	-	2	1	4	3.6
7. In my experience, all group members have participated equally.	-	-	1	2	6	4.6
8. If a group member does not actively participate in my group, it is the responsibility of me and the other group members to speak up about it.	-	2	2	-	5	3.9
9. "Group testing is not fair!" - "I can get a good grade on my own; why should I help someone who doesn't study?"	5	1	2	1	-	1.9
10. I would like more instructors to use group testing.	-	-	-	2	7	4.8

# What do you like best about group testing?

“Group testing has definitely improved my overall grades”

“We listen to our peers better. We are able to clarify things to make sure our peers understand the material.”

“I think debating over certain questions is good for us. It teaches us to be clear and concise when we speak our point of view.”

“I understand my own mistakes better by getting it clarified by a group member.”

“Being able to agree upon an answer respectfully and hearing people’s reasoning and logic behind their choice.”

“When I take a test, no matter how prepared I am, there’s always a few questions I’m unsure of...”

“...I found it beneficial to bounce around ideas/answers with classmates.”

“I thought it was a great benefit. I enjoyed it.”

“It’s helpful to talk about it with the others.”

# What do you like least about group testing?

“N/A. I enjoyed the opportunity to do group testing...”

“I’m happy with the whole process!”

“N/A!”

“...I think it helps all the students to do better.”

“Nothing I dislike about it.”

“Nothing!”

“People can take things personally when their choice is not chosen.”

“There are certain people who I don’t feel work as well together...”

“... not with me specifically, but just in the group setting in general.”

## Observations during group testing

- Usually students in a group began by each stating their individual answer to a question. Discussion was sometimes short and the most commonly selected answer was agreed on.
- Some questions required more discussion.
- Students were respectful of each other. They listened quietly. No one responded rudely or put other students down.
- Students explained to the group why they had chosen a particular answer and rejected others.
- Students made sure all group members had an opportunity to speak. If a group member appeared to be sitting back without contributing, other students appeared to ask for his/her input.
- The instructor did not need to intervene in group discussions.

## Conclusion

- All students benefited from group testing:
  - Academic performance increased.
  - Student satisfaction increased.
- Students became more engaged in learning:
  - Discussed material, facilitated understanding, encouraged each other and complimented each other.
- Students had emotional and intellectual support to go beyond their present knowledge and skills and accomplish new, shared goals.
- Cooperative learning, including group testing, prepares students for becoming part of a healthcare team.