

Background

What is Real-Time Assessment?

Real-time assessment (RTA) is a teaching philosophy that relies heavily on formative assessment activities. These activities are low stakes, and are frequent. The nature of the activities and their frequency is highly dependent upon the course, the makeup of students in that course, and the individual faculty member. The results of these assessments serve to guide the faculty member to understand: (a) how well students understand the material, and (b) what the next steps should be taken to ensure that student learning continues to occur. The benefits of RTA are that students and faculty are acutely aware of progress towards learning objectives, and are able to tailor the course to ensure that all students have a better opportunity to meet the expectations of the instructor and the learning outcomes of the course.

The Course

Human Anatomy & Physiology Laboratory is a 200-level, fall-spring sequence of courses for multiple majors including pre-professional programs (Health Science, Pre-Physical Therapy, Pre-Physician Assistant), as well as Biology and Sports Biology Majors. The course enrolls approximately 120 students, distributed across seven sections of between 12 and 20 students; nearly all students complete the 2-semester sequence. The class usually (when in person) meets once a week for 2-hours.

During academic year (2020-2021), due to the Covid-19 pandemic, the course was fully remote in the fall semester, and hybrid in the spring semester (with restricted in-person labs for dissections only). Both semesters consisted of synchronous instruction via Zoom for a minimum of one hour per week, in addition to online, asynchronous content and lab activities (including virtual lab simulations). This format functioned effectively as a “flipped-classroom” model, with the bulk of content and lab simulations completed by students before each synchronous class meeting. The shortened, synchronous class meetings were dedicated to targeted review of the content and comprehension checking. Because instruction this year took place remotely via Zoom, typical methods of monitoring student engagement and progress were either not possible, or not readily transferable to a remote learning environment. As a result, new methods of employing formative, real-time assessment techniques were required.

The Interventions

No-Point Quizzes

Frequency:
Start of nearly every synchronous meeting

Purpose:
Quick check for pre-lab engagement of content

Question types:

- Identify or name anatomical structures
 - Physiology questions
- Student responses via:**
- Direct message to instructor via the chat feature in Zoom (*students could not see other students' responses)
 - Marking answer on shared screen using Zoom annotation feature.

Breakout Groups

Frequency:
Occasional

Purpose:
Review of more complex content with peer support

Format:
Discussion questions via shared Google Docs document

- Students respond as a group to a set of questions
- Type answers into Google Doc document
- Share back to whole group

- Annotation of images via shared Jamboard (virtual whiteboard)
- Students provide annotations to images that illustrate anatomical or physiological principles
 - Students draw processes on shared Jamboard slide
 - Share back to whole group

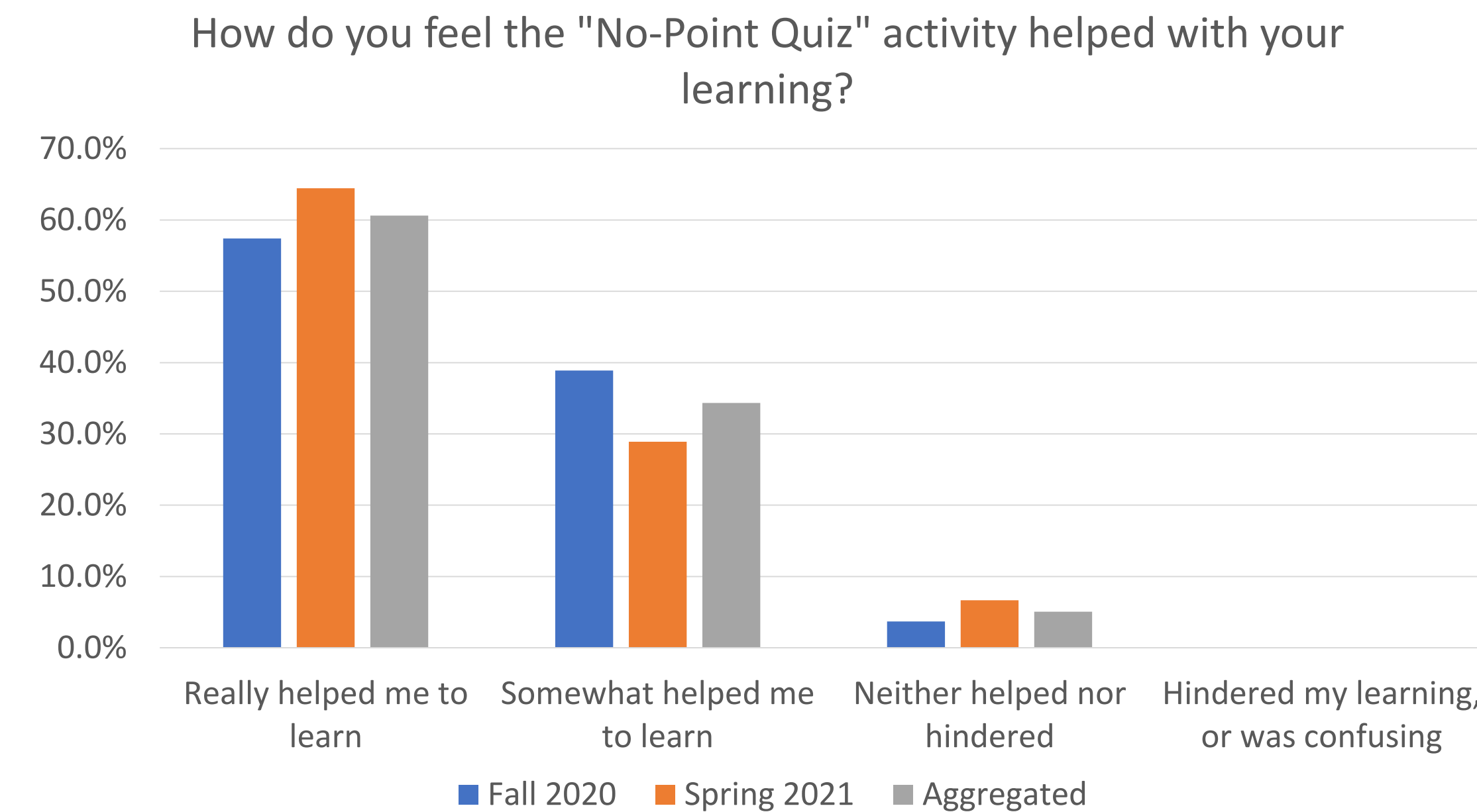
The Questions

In the context of remote, synchronous learning:

- How will the chosen RTA activities be received by students? (i.e. Will they enjoy participating in these activities?)
- Will using these RTA interventions help students learn the content?

Findings

No-Point Quizzes

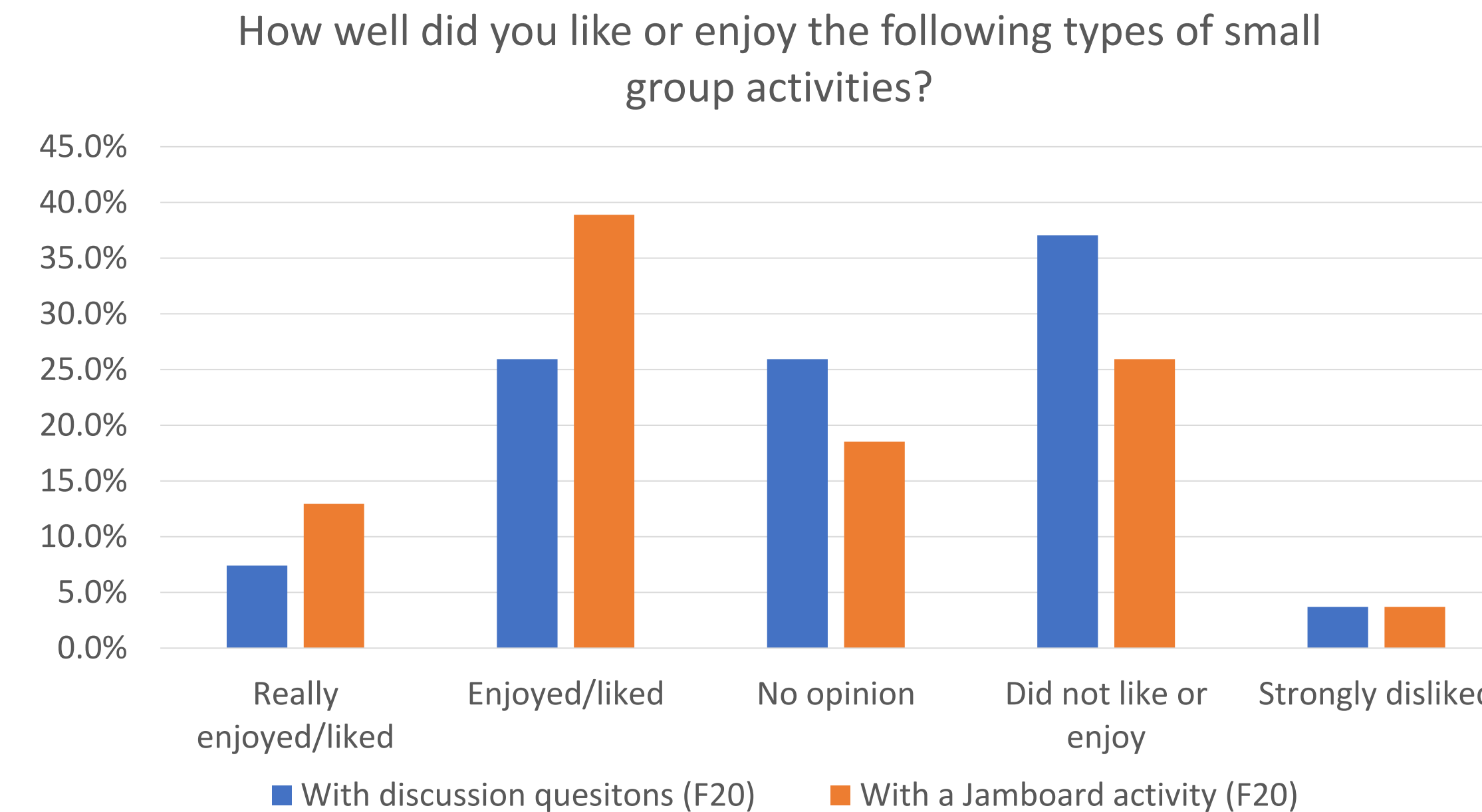


FALL

Nearly 91% of students (49/54) really enjoyed or enjoyed taking the no-point quizzes; three students had no opinion, and only two students disliked or strongly disliked this activity.

Most students (96%; 52/54) thought that this activity somewhat or really helped them to learn; two students felt neutral, and zero students thought it hindered their learning.

Breakout Groups

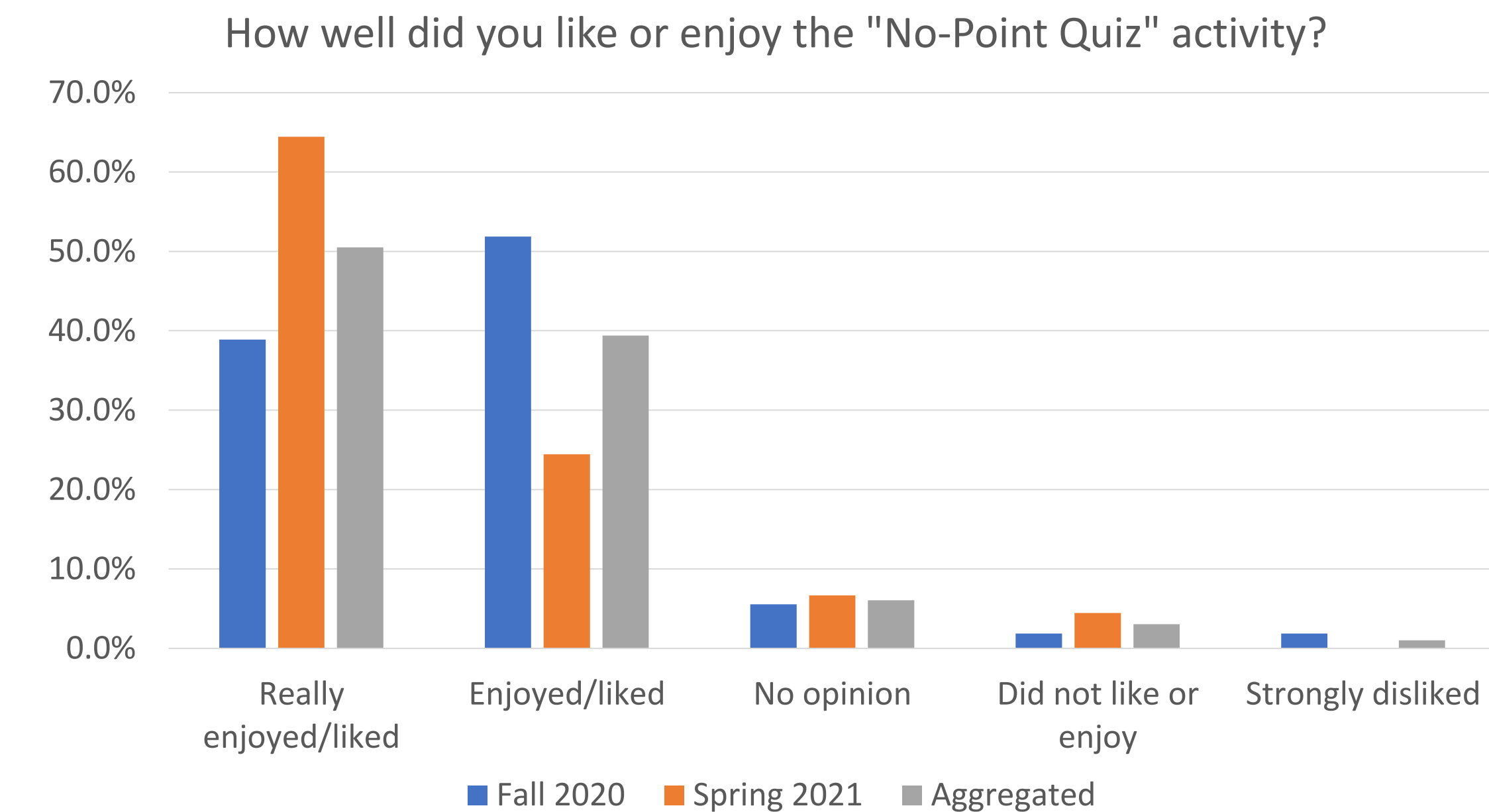


WHEN PAIRED WITH DISCUSSION QUESTIONS:

More students (40.7%; 22/54) **did not like, or strongly disliked** small group work; and 33.3% (18/54) enjoyed or really enjoyed it.

Regarding impact on learning, the majority of students (51.9%; 28/54) **expressed neutrality** (neither helped nor hindered learning), while 42.9% (24/54) found the activity somewhat helpful (21/54), or really helpful (3/54); four students found it actually hindered their learning.

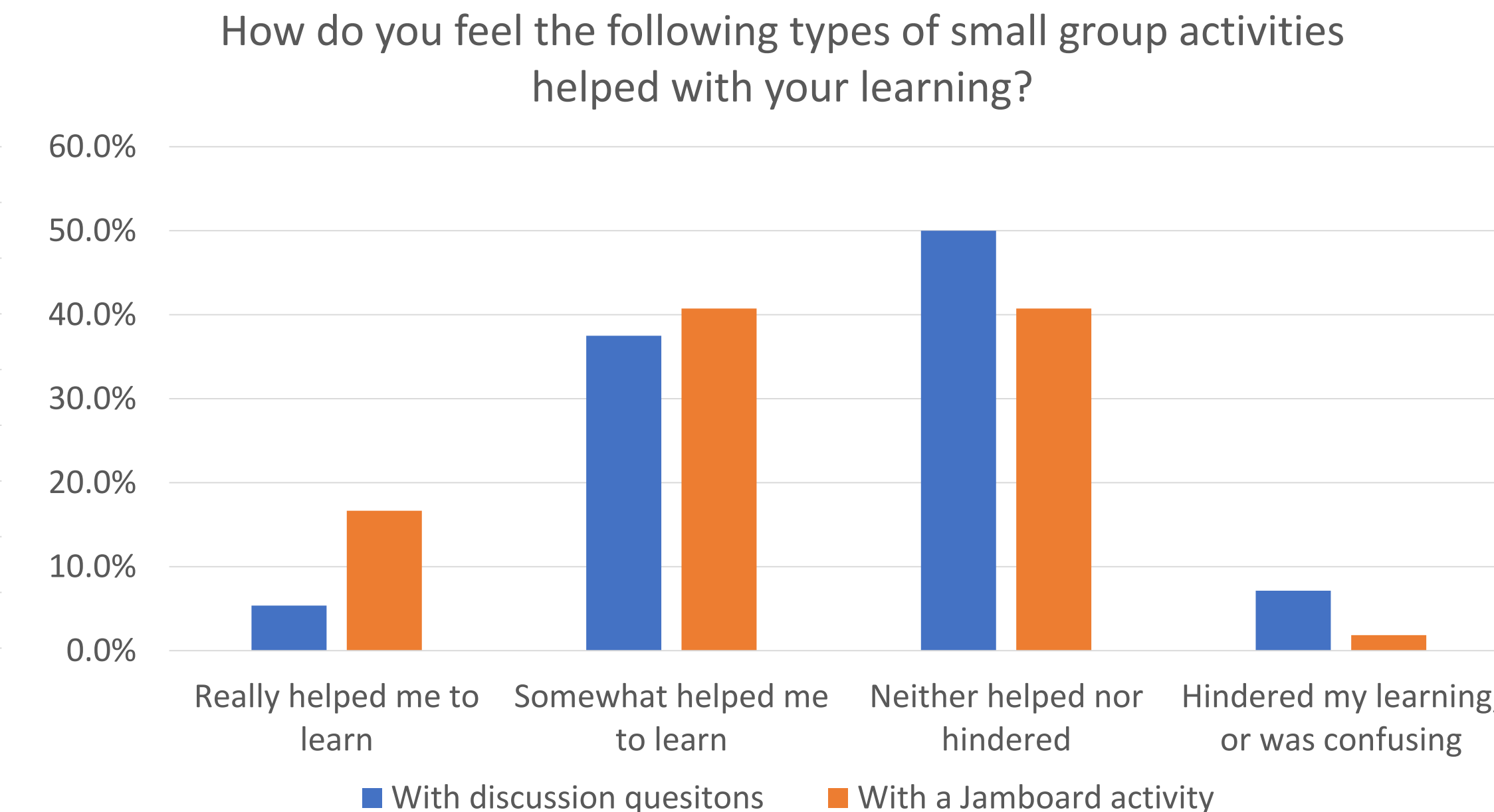
In order to determine how the RTA interventions impacted student engagement and learning, I surveyed students at the end of the fall 2020 and spring 2021 semesters. I asked students to rate their overall enjoyment with each method, and also how they felt each method helped them to learn (even if it was not their most enjoyable experience). A total of 54 out of 95 students responded to the fall survey, and 45 out of 93 students responded to the spring survey. Information regarding breakout rooms was only included for the fall 2020 semester.



SPRING

Nearly 89% of students (40/45) really enjoyed or enjoyed the quizzes; including more students who “really enjoyed” the quizzes in the spring (64.4%; 29/45) compared to the fall (38.9%; 21/54). Two students did not enjoy the quizzes in the spring, and zero students expressed strong dislike.

Most students (93.3%; 42/45) felt that the quizzes somewhat or really helped them to learn; three students had no opinion and zero students felt this activity hindered their learning.



WHEN PAIRED WITH JAMBOARD:

A majority of students (51.9%; 28/54) **enjoyed, or really enjoyed** small group work; only 29.6% (22/54) did not like, or strongly disliked it.

Regarding impact on learning, the majority of students (57.4%; 31/54) found small group work with Jamboard **somewhat helpful (22/54) or really helpful (9/54)**; fewer students (42.6%; 23/54) found the impact neutral; one student expressed that it hindered their learning.

INSTRUCTOR OBSERVATIONS

- No-point quizzes allowed me to quickly identify student confusion or misconceptions about content

- I was able to make targeted, immediate adjustments to instruction for individuals or the class as a whole.

- This intervention was easy to implement in a remote environment using the online tools that the Zoom platform provided.

- Students seemed more engaged and willing to participate when performing this activity than during general/open discussion, or during small group work.

INSTRUCTOR OBSERVATIONS

- It was relatively easy to covertly monitor progress as students worked in small groups using the shared documents

- I was able to intervene as necessary to keep students on track.

- This monitoring method allowed me to avoid interrupting groups that were making good progress and doing well.

- There is strong resistance (i.e. “push-back”) from students with regard to group work.

- Frequently I would find groups in which no one would be willing to speak to one another.

Implications for Future Practice

- It is necessary to continue to monitor student progress in real-time and in a variety of ways
- Frequent and varied assessment should be used to immediately inform course decisions to help students meet course learning outcomes.
- Steps should be taken to bring the successful assessment methods from the remote environment back into a face-to-face classroom.

GENERAL FINDINGS

- Students identified No-Point Quizzes as both enjoyable and helping with learning.
- Students did not enjoy Breakout Groups in general, but small group work with discussions was the least enjoyable.
- More students acknowledged they **learned from the activities, even if they did not enjoy doing them.**
 - Only 33.3% of students enjoyed or really enjoyed small groups with discussion questions; while nearly 43% thought it somewhat or really helped with learning
 - Nearly 52% of students enjoyed or really enjoyed small groups using Jamboard; while 57.4% thought it somewhat or really helped with learning
 - 90% of students enjoyed or really enjoyed No-Point Quizzes; while 94.9% of students indicated it was useful for learning.