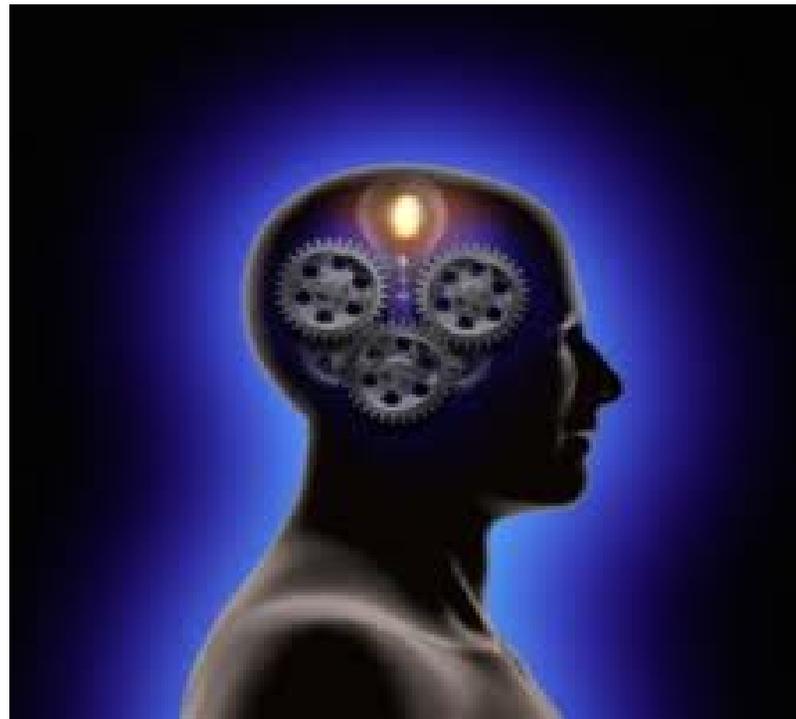


Undergraduates' Perceptions of In-Class Active Learning Techniques in Science and Math Lectures



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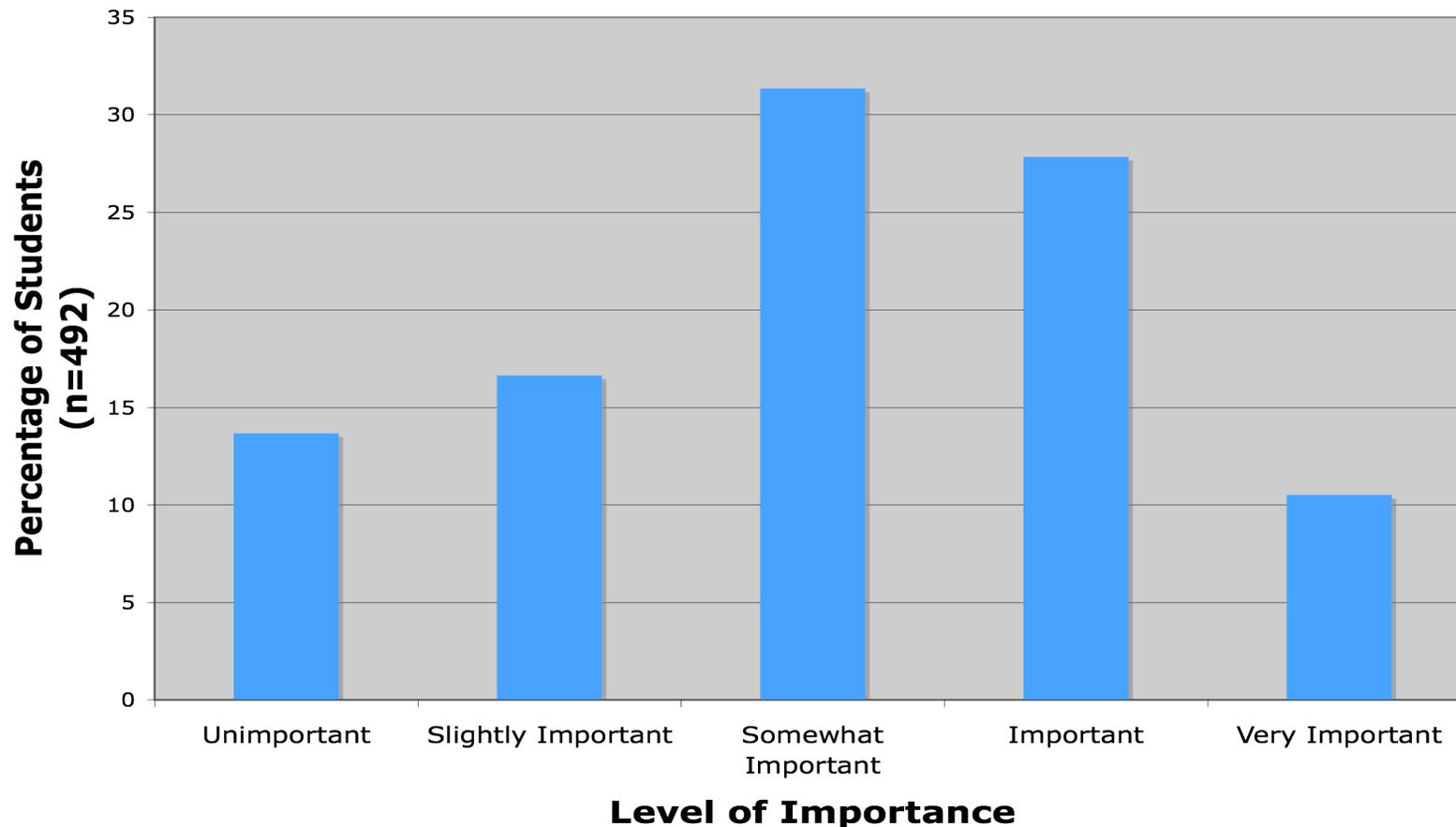
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Background

- Data selected from a larger study exploring the factors undergraduates perceive as influential to their academic performance in science/math
- Students rated the importance of the use of active learning techniques (ALT) in science/math lectures
- 260 open-ended comments were collected regarding the use of in-class ALT

Close-ended Survey Question:

How important were the use of in-class ALT to influencing your academic performance in science and math courses?

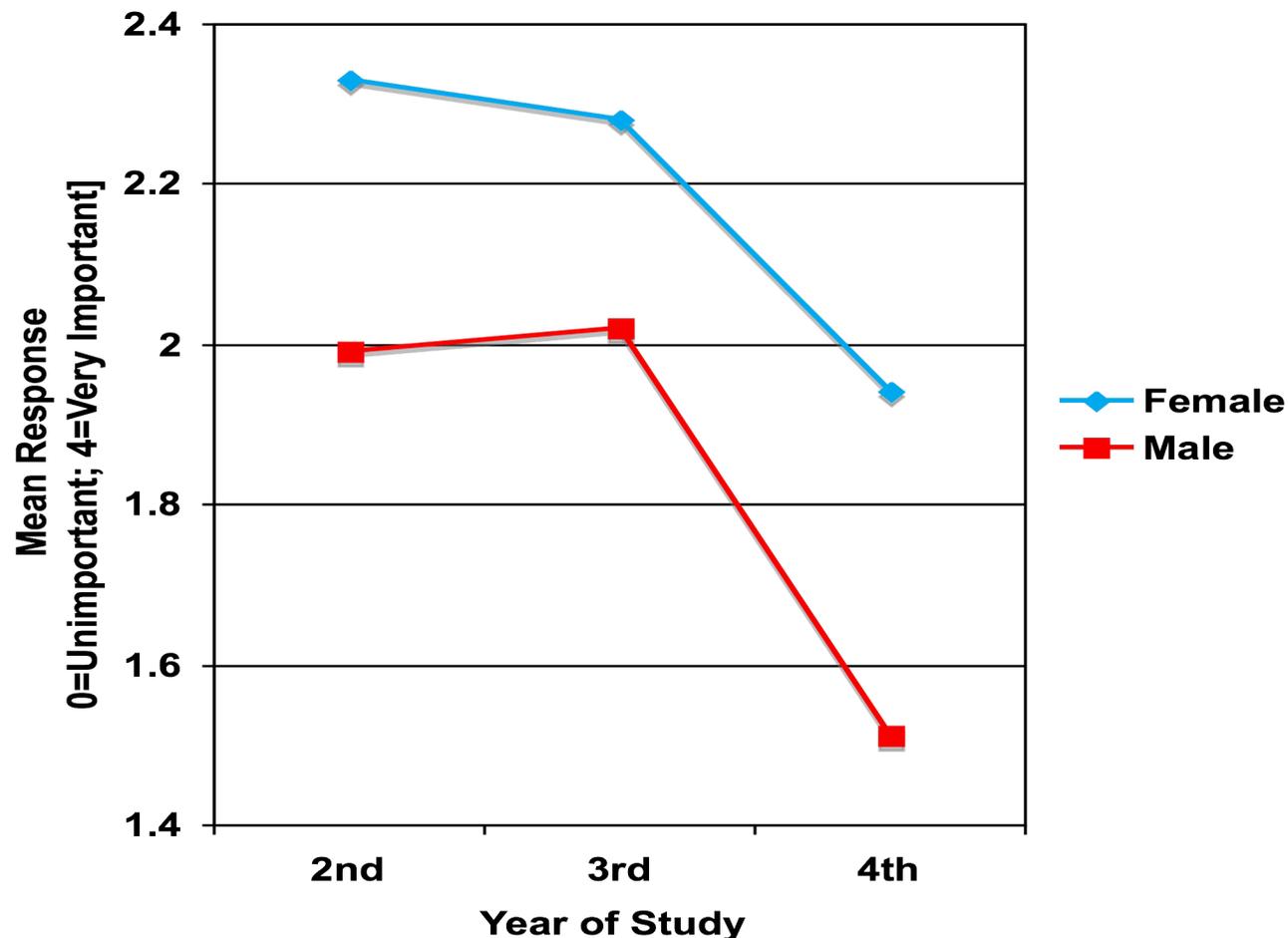


Statistically Significant Differences

Statistically significant differences were detected between:

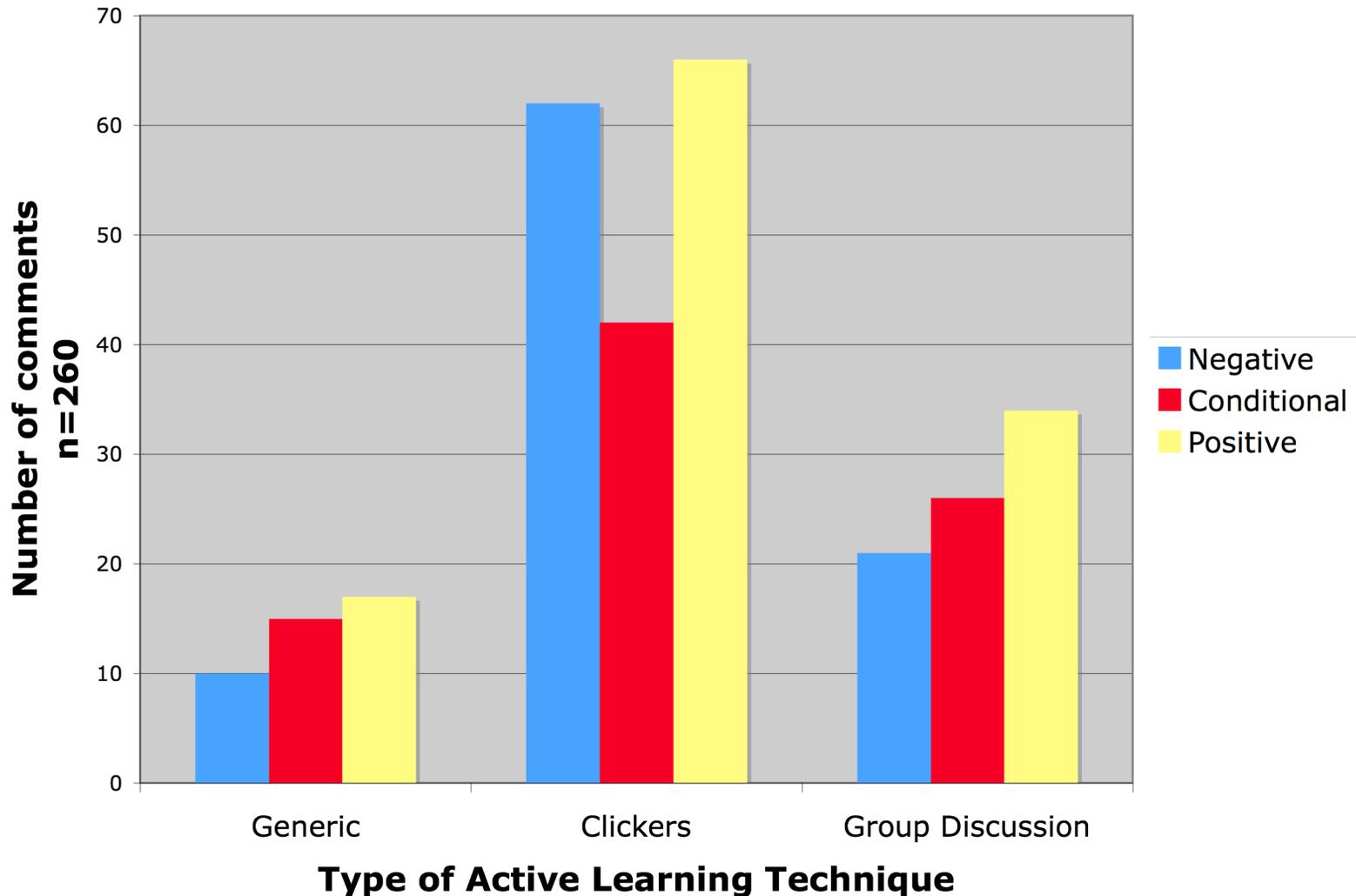
- third and fourth year students' [$F(2,252) = 7.17, p = 0.001$]
- male and female responses [$t = -3.240, p = 0.001$]

Mean response to the close-ended survey question with respect to students' gender and year of study



Open-Ended Survey Question:

Please comment on the use of ALT in science/math lectures



Negative Comments

Students' perceptions of Active Learning Techniques	Number of times it was referred to in the comments		
	General	Clickers	Group Discussion
Waste of time & money	6	35	18
Used solely for attendance	-	6	-
Not helpful because students tend to guess or copy one another	-	5	-
Prefer traditional methods of lecturing	6	-	1

I find these approaches a waste of class time, especially group activities as most times science classes are too large to ensure everyone is productive.

I enjoy a classic lecture style class...At the current time classes seem so focused on trying to make everything very interactive and it is not helping my learning.

Conditional Comments

Students' perceptions of Active Learning Techniques	Number of times it was referred to in the comments		
	General	Clickers	Group Discussion
How the instructor uses these techniques is important	6	14	2
Need for questions that are challenging, relevant and integrated well within lecture	2	13	-
Need for structure/instruction with group discussion	-	-	8
Effectiveness depends on the students in the class	2	-	14

It depends on the type of clicker question asked. Sometimes, the clicker questions are too easy and the answer can be found in the textbook. The questions should be a bit more challenging to test our ability to apply the concepts.

Group activities are only useful when there is structure to what the group should be doing and clear instructions.

Positive Comments

Students' perceptions of Active Learning Techniques	Number of times it was referred to in the comments		
	General	Clickers	Group Discussion
Keep students engaged and help them to pay attention in class	1	15	1
Provide feedback for students and instructor	-	15	2
Helps with understanding	5	22	5
Discussions with peers reveal students' misunderstandings	1	7	5
Good for big classes	1	8	-

I find that the use of in-class learning techniques helps to keep me interested in the material. Engaging with my classmates and the teacher reinforces the material and helps me understand it.

Clickers are a really great, great thing. Instant feedback, no worries from shyness, great chance to solidify understanding with peers while discussing question or with prof after results appear.

Discussion/Implications

- Students' perceptions of the use of in-class ALT are diverse
- Their effective use is dependent on both instructors' and students' engagement with the techniques
- Students advise instructors to:
 - Explain why ALT are being used and how students should engage with both the techniques and one another
 - Provide guidelines/instructions on how to work in groups
 - Integrate challenging and relevant questions within lecture