

Standing Up for Physically Active Learning

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ico

SHE

School of
Health Professions
Education



Too much sitting



Why encourage sitting?



Is it necessary for learning?

Being active may be better for learning



Overall research question:

What are the effects of replacing sitting with standing in higher education?

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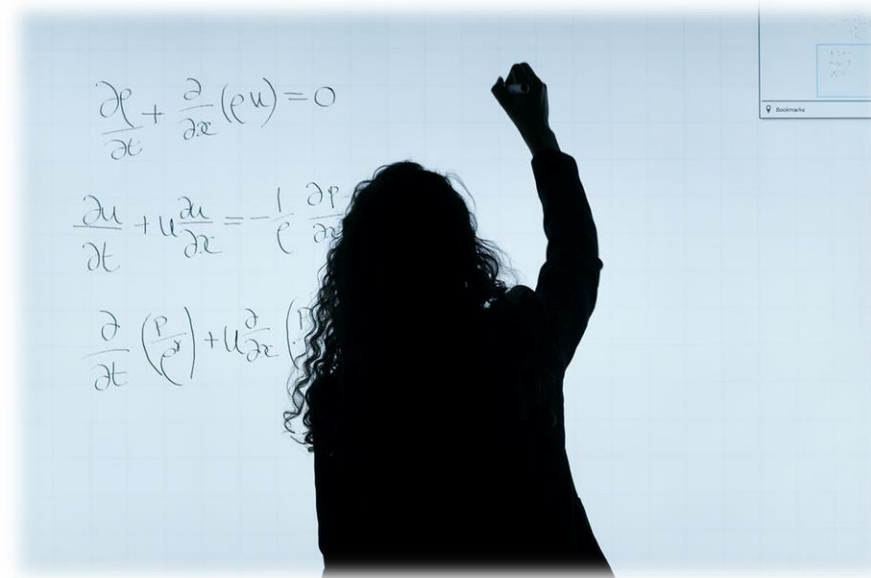
- Physical activity behavior



Overall research question:

What are the effects of replacing sitting with standing in higher education?

- Physical activity behavior
- Learning



Problem-Based Learning (PBL) in tutorial meetings



Problem-Based Learning (PBL) in tutorial meetings

Pre-
discussion



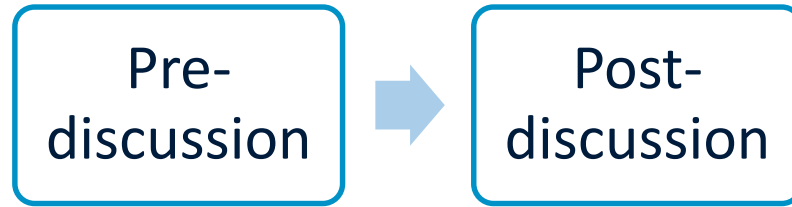
Problem-Based Learning (PBL) in tutorial meetings



Self-study



Problem-Based Learning (PBL) in tutorial meetings



Self-study



Tutorial group meetings



Tutorial group meetings



Tutorial group meetings



9 weeks, 13 tutorial meetings, 2-hour each

Physical activity behavior



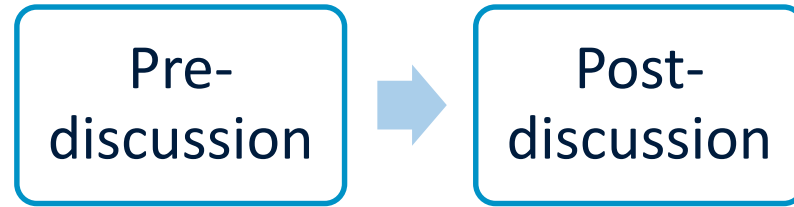
Main finding: Physical activity behavior

↓ Sitting

↑ Physical activity



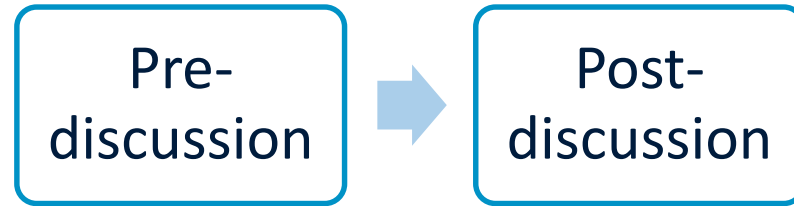
Learning



Self-study



Learning



Self-study

Two tutorial cases:

- Week 2
- Week 6



Sit	Stand	Sit	Stand
Pre-discussion		Post-discussion	
Case 1			

Sit	Stand	Sit	Stand	Sit	Stand	Sit	Stand
Pre-discussion		Post-discussion		Pre-discussion		Post-discussion	
Case 1				Case 2			

1 2 3 4 5 6 7 8

Sit	Stand	Sit	Stand	Sit	Stand	Sit	Stand
Pre-discussion		Post-discussion		Pre-discussion		Post-discussion	
Case 1				Case 2			

1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Sit				Stand				Sit				Stand				Sit				Stand				Sit				Stand			
Pre-discussion								Post-discussion								Pre-discussion								Post-discussion							
Case 1												Case 2																			

Learning-oriented interactions

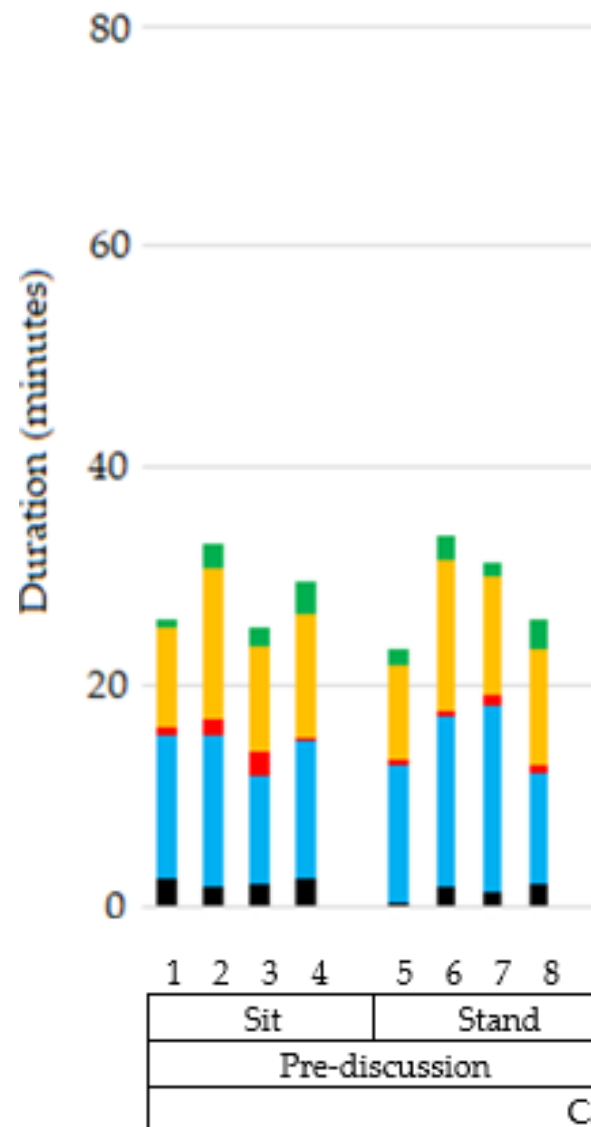
- Questions
- Reasoning
- Conflicts

Non-learning interactions

- Off-task
- Procedural

(Visschers-Pleijers et al., 2016)

1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8								
Sit				Stand				Sit				Stand				Sit				Stand				Sit				Stand			
Pre-discussion								Post-discussion								Pre-discussion								Post-discussion							
Case 1												Case 2																			



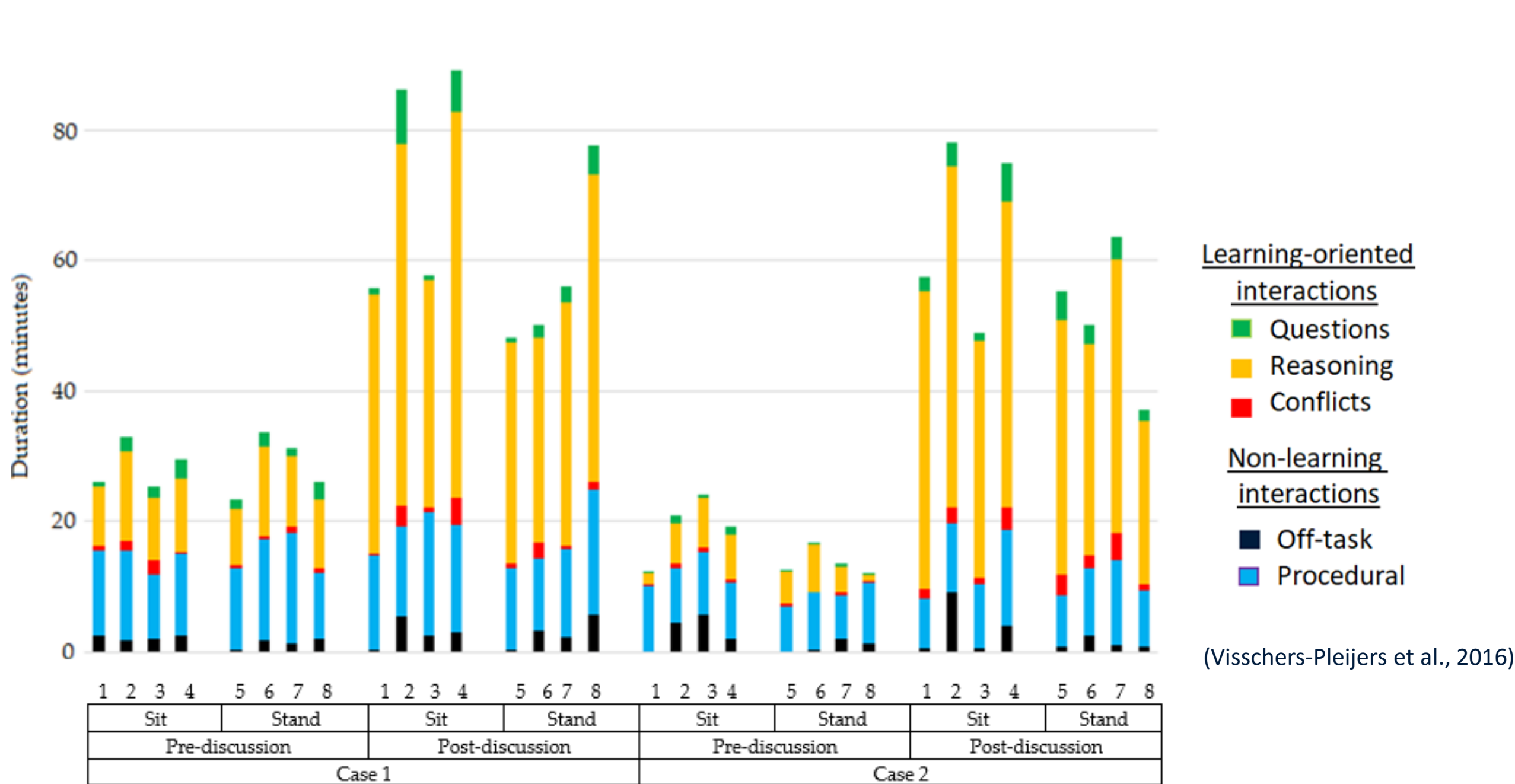
Learning-oriented interactions

- Questions
- Reasoning
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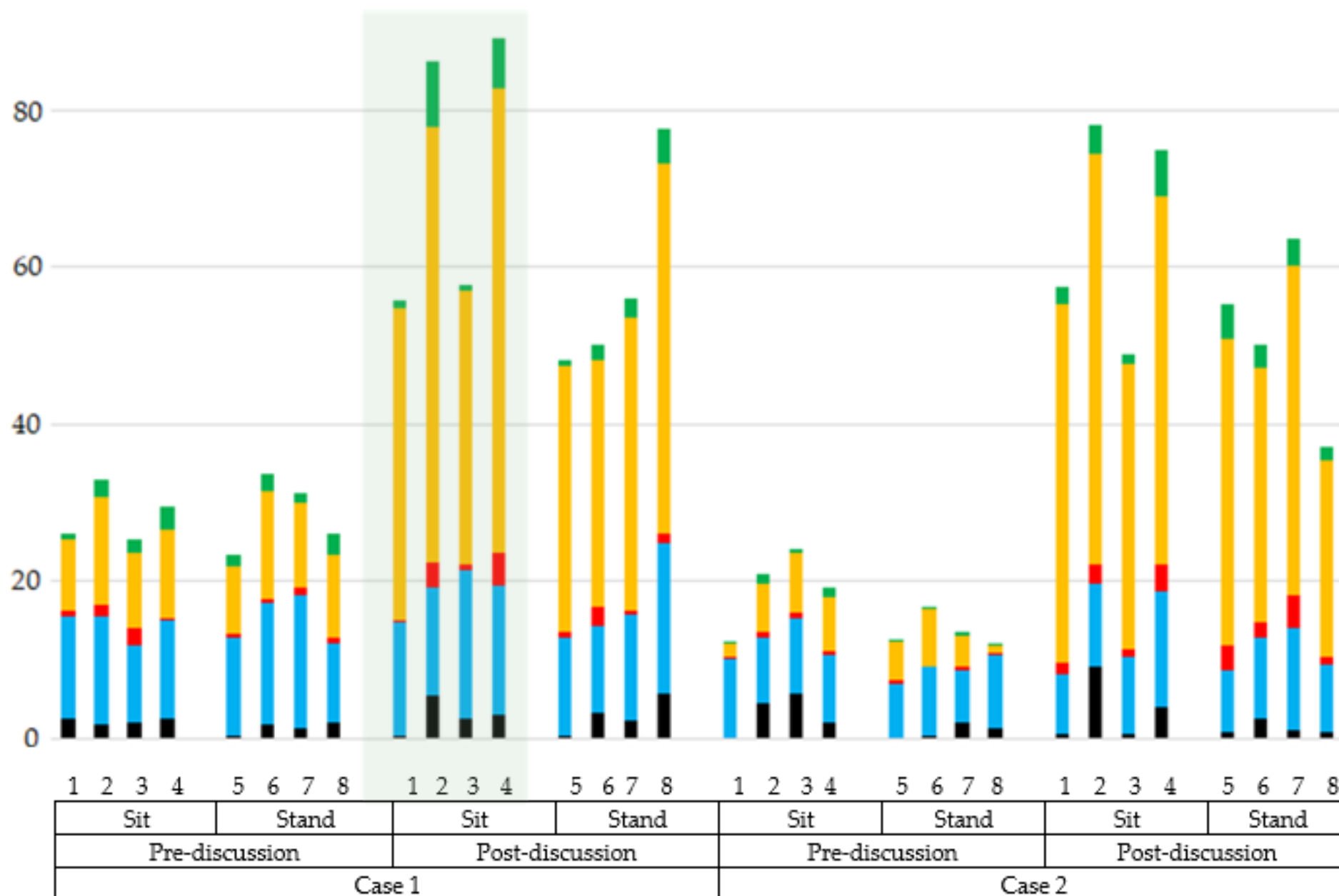
Non-learning interactions

- Off-task
- Procedural

(Visschers-Pleijers et al., 2016)



Duration (minutes)



Learning-oriented interactions

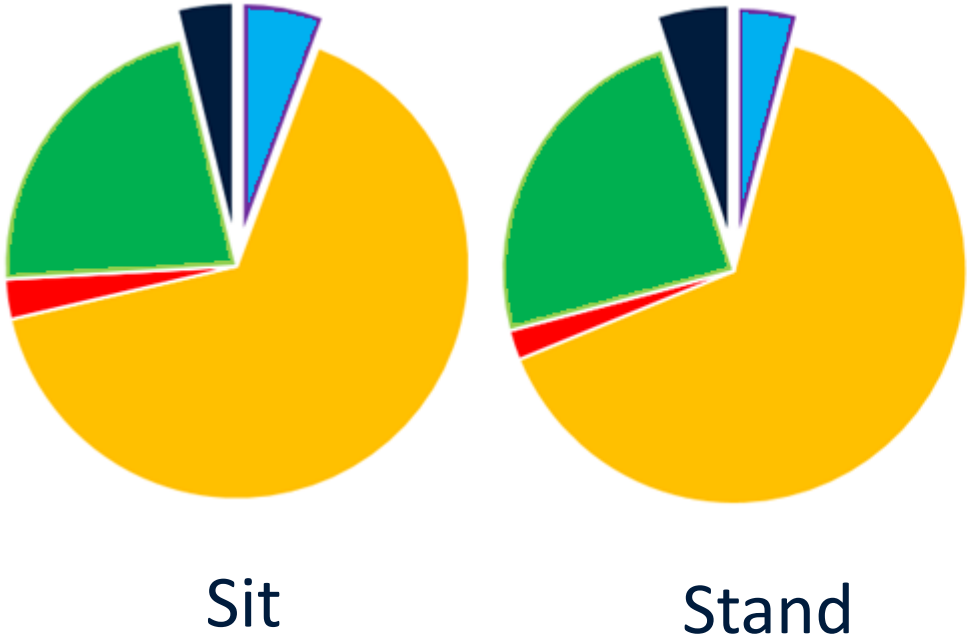
- Questions
- Reasoning
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Non-learning interactions

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(Visschers-Pleijers et al., 2016)

Tutorial group interactions



Learning-oriented interactions

- Questions
- Reasoning
- Conflicts

Non-learning interactions

- Off-task
- Procedural

Concept map

Concept map

List all the keywords that are related to “early embryonic development until blastocyst, and gene regulation”.

1. Early embryonic development
2. Blastocyst
3. Gene regulation

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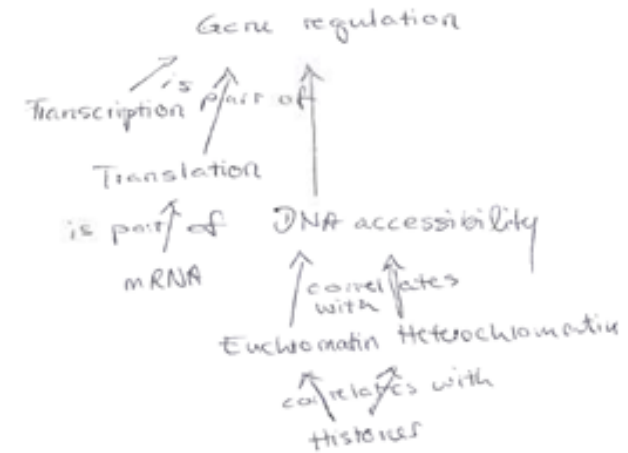
Please draw your Concept Map here:

Concept map

List all the keywords that are related to "early embryonic development until blastocyst, and gene regulation".

1. Early embryonic development
2. Blastocyst
3. Gene regulation
4. Zygote
5. Oocyte
6. Spermatozoa
7. Transcription
8. Translation
9. Fertilization
10. Cleavage
11. Morula
12. DNA accessibility
13. Gametogenesis
14. Ovulation
15. mRNA
16. Euchromatin
17. Heterochromatin
18. Histones

Please draw your Concept Map here:

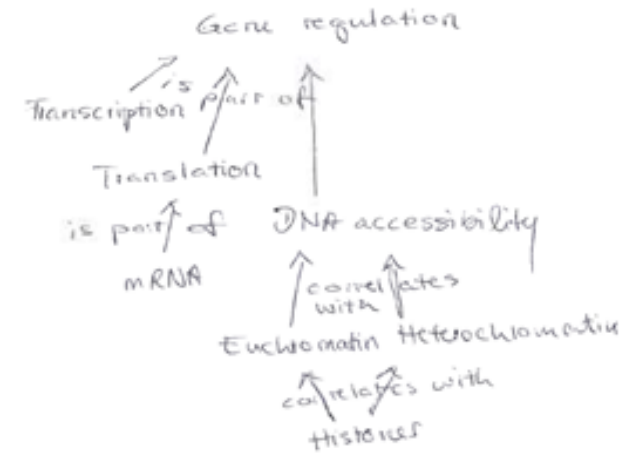


Concept map

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Please draw your Concept Map here:



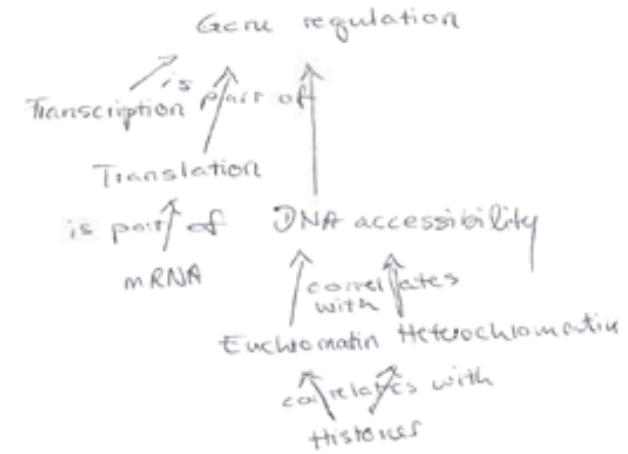
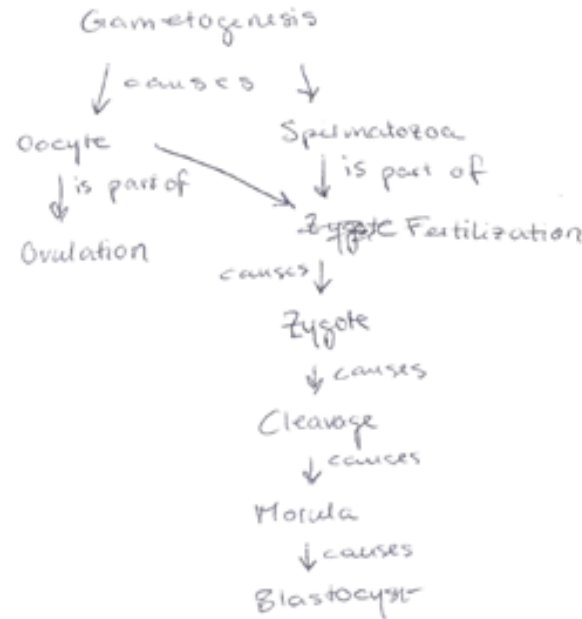
✓ Keyword scores

Concept map

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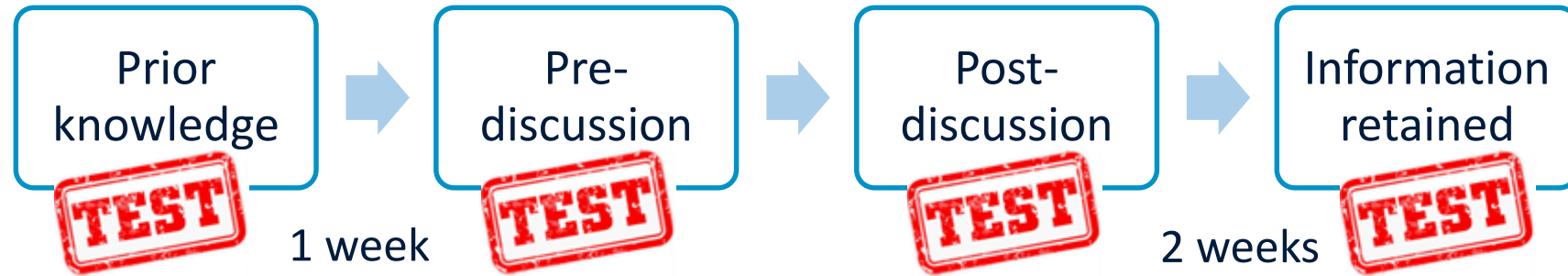
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Please draw your Concept Map here:



- ✓ Keyword scores
- ✓ Number of correct relationships

Concept map



Concept map

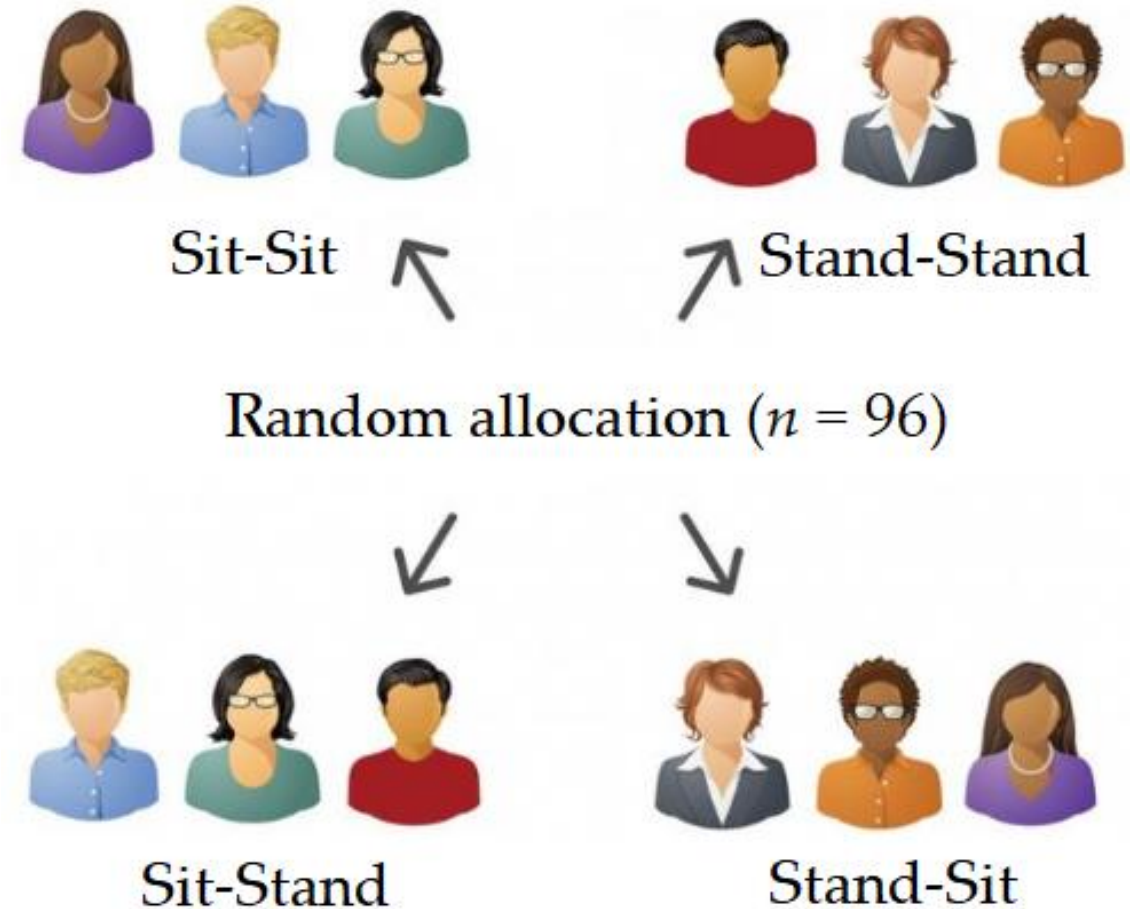
Context-dependent memory

Sit-Stand:

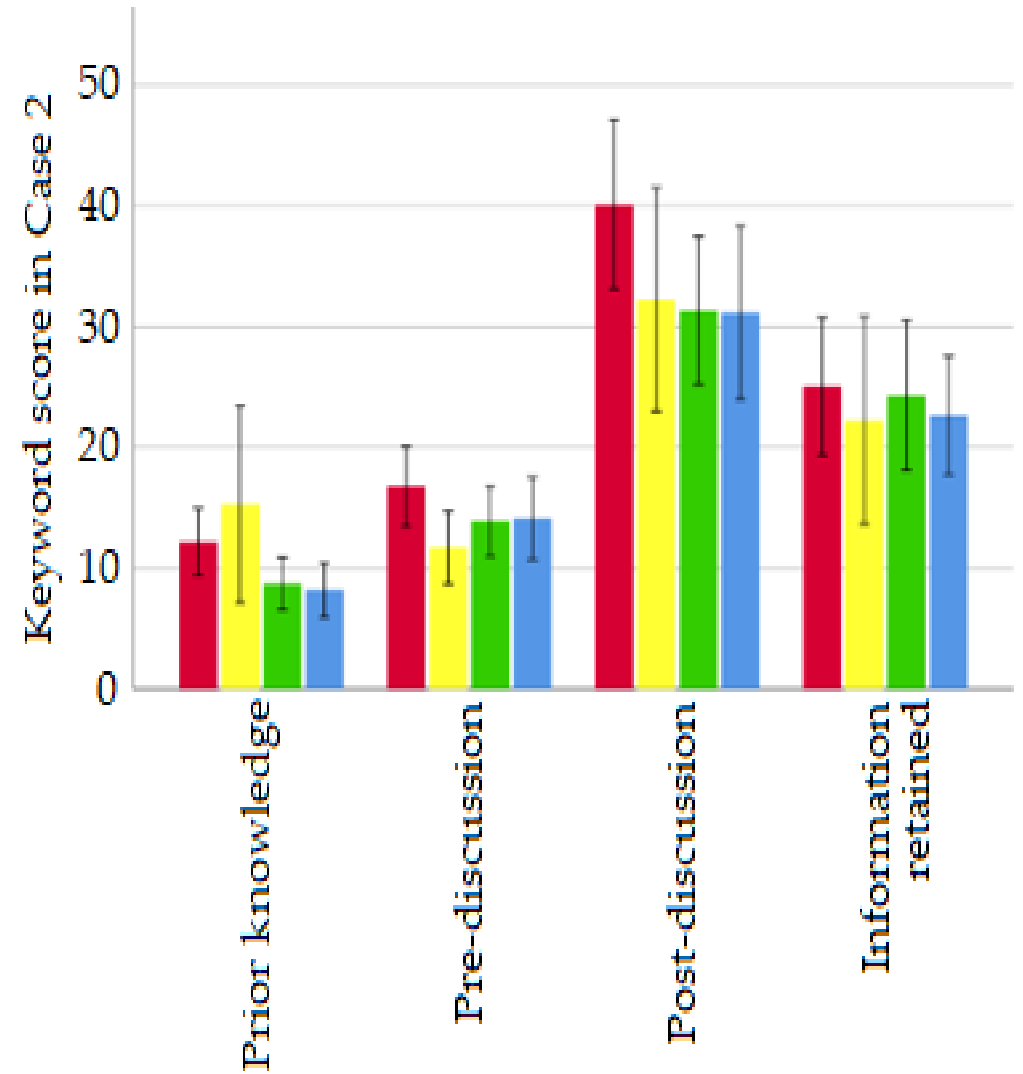
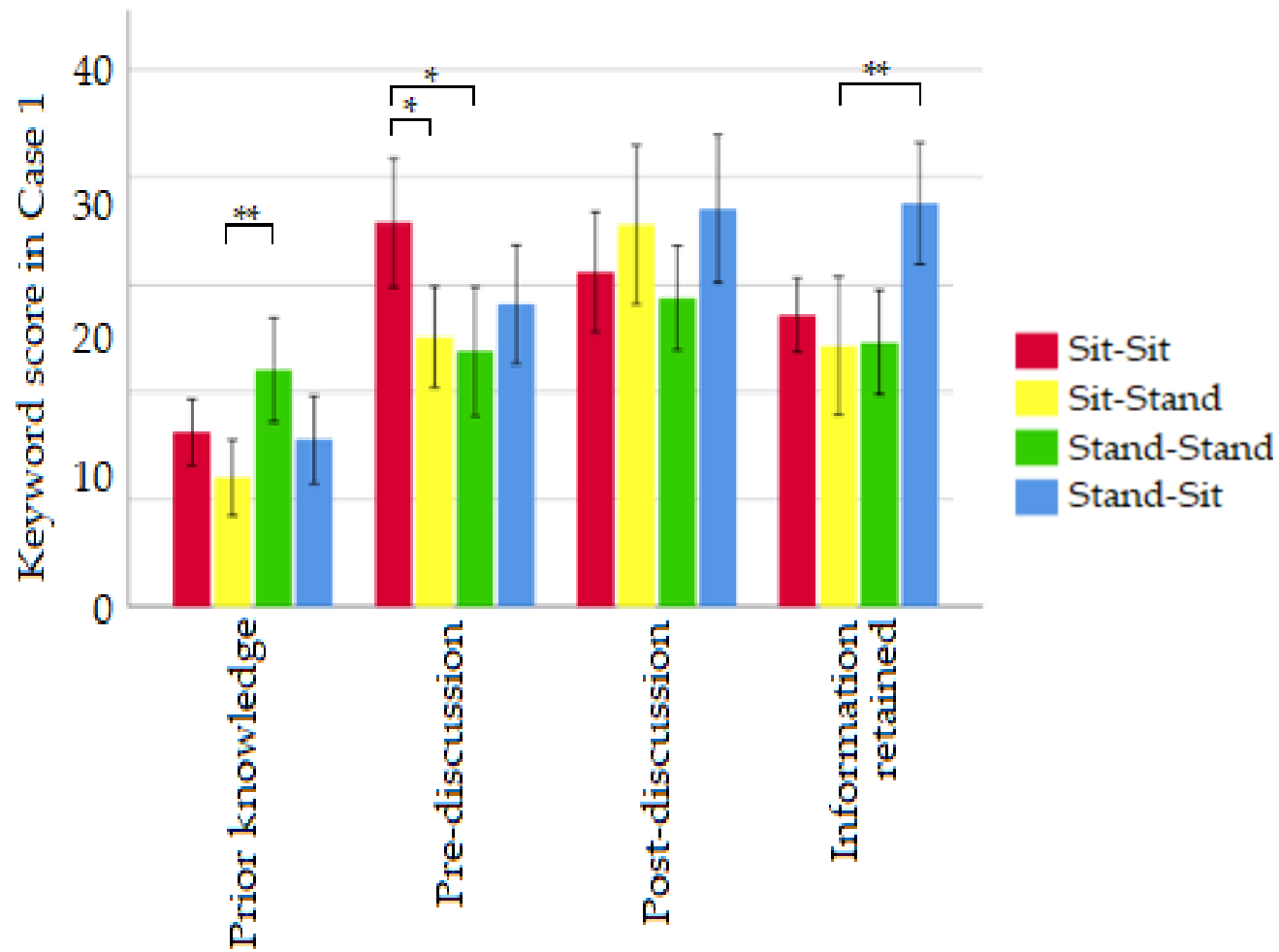
- Sit during tutorial
- Stand during concept map

Stand-Sit:

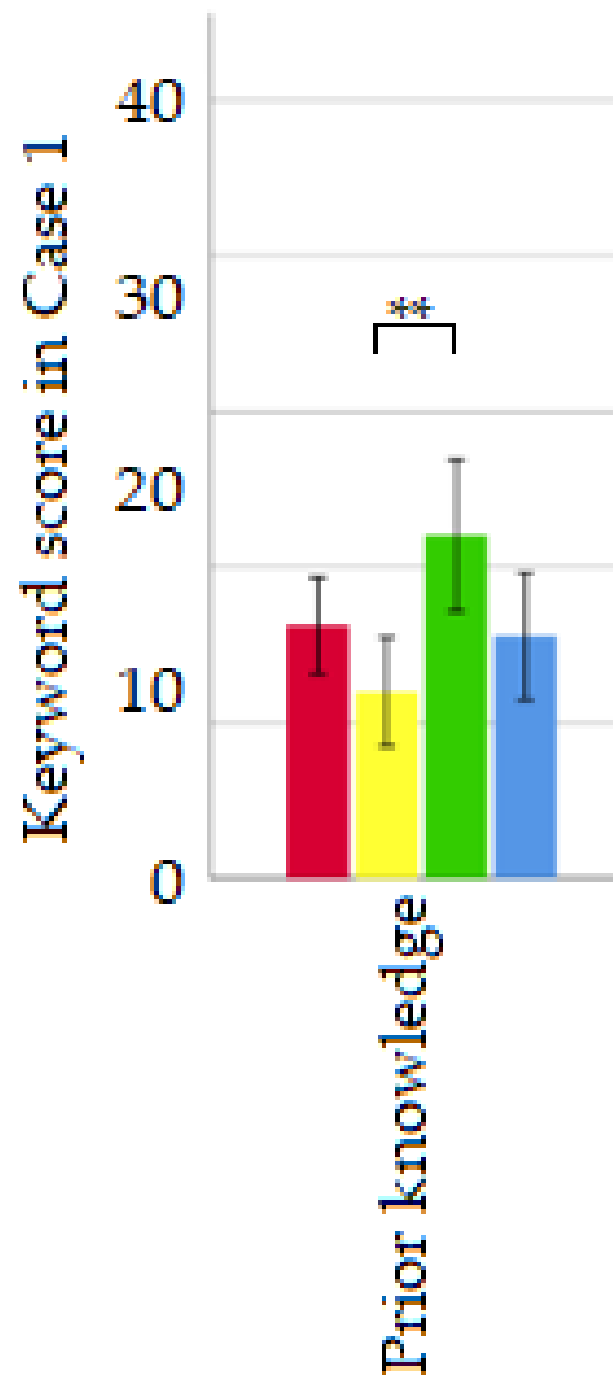
- Stand during tutorial
- Sit during concept map



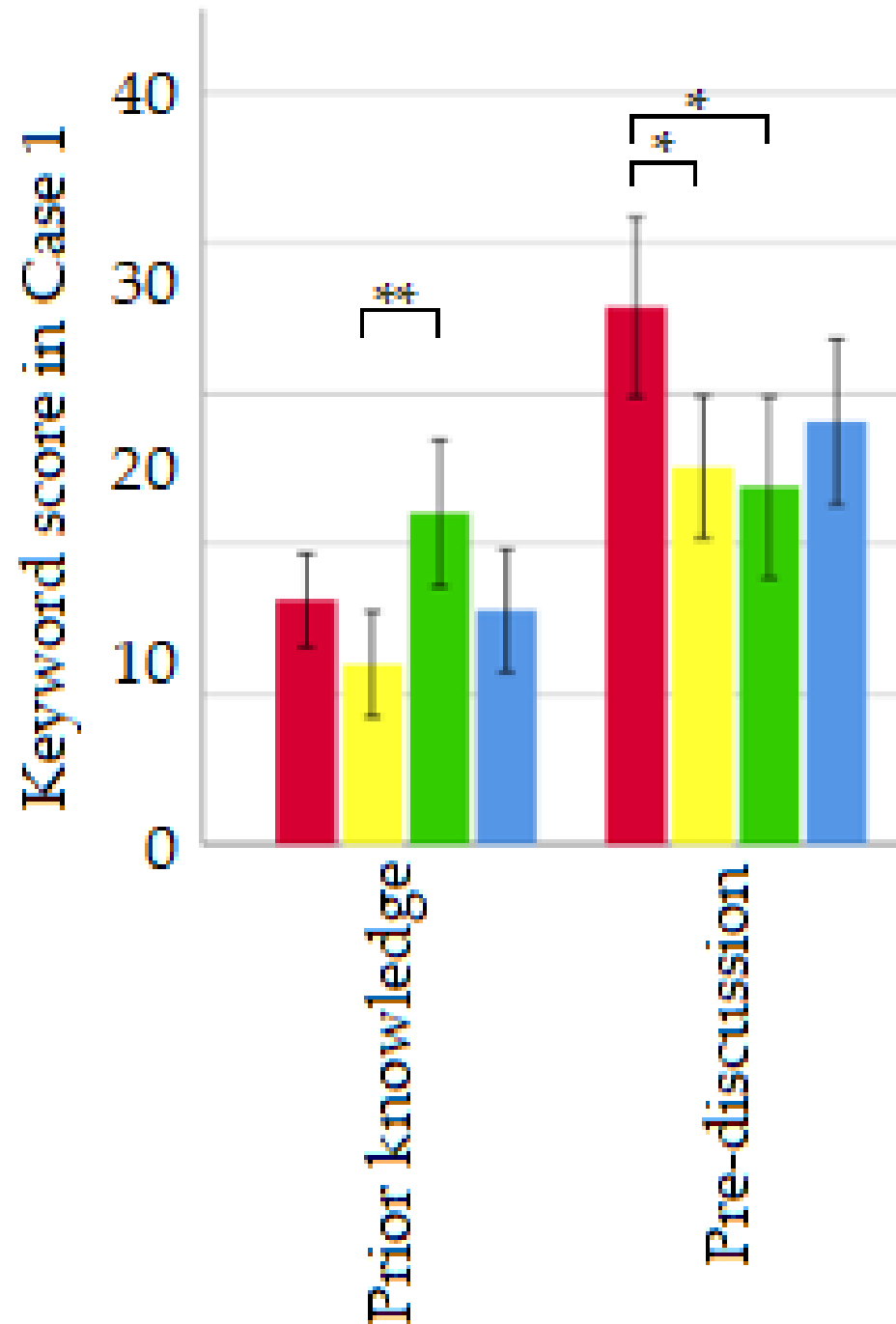
Concept map



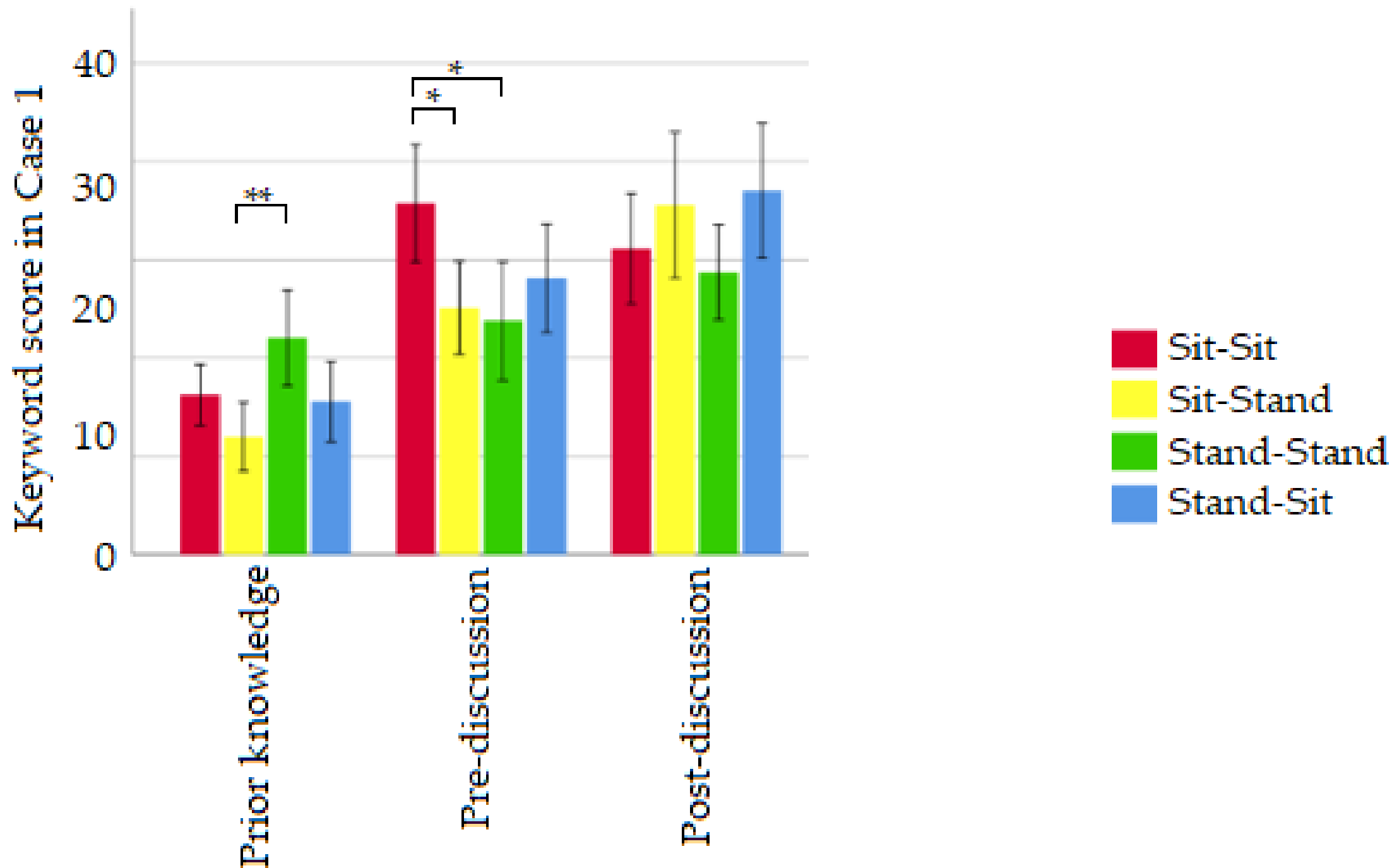
Bar graph with 95% confidence interval error bars * $p < .05$; ** $p < .01$.

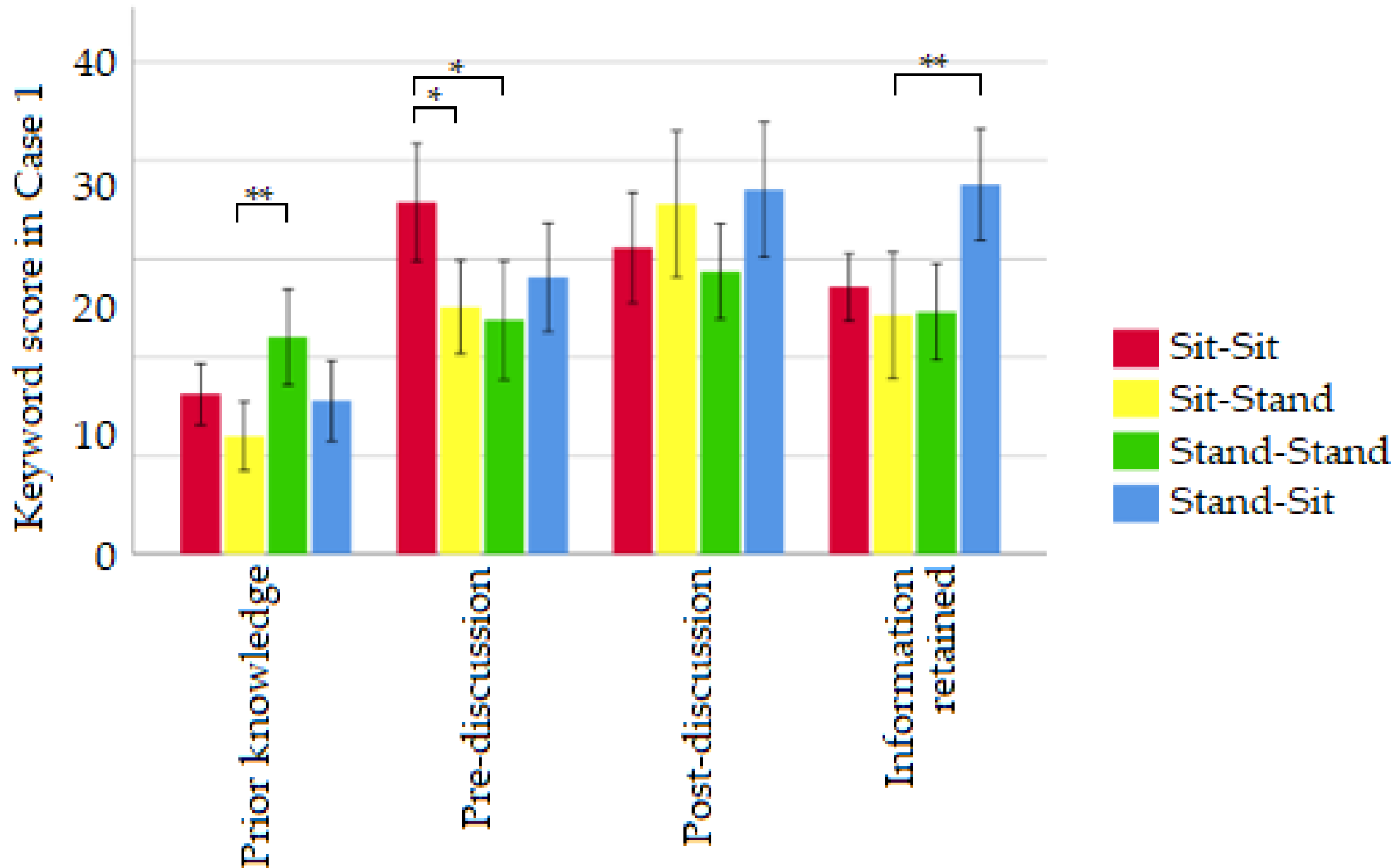


- Sit-Sit
- Sit-Stand
- Stand-Stand
- Stand-Sit

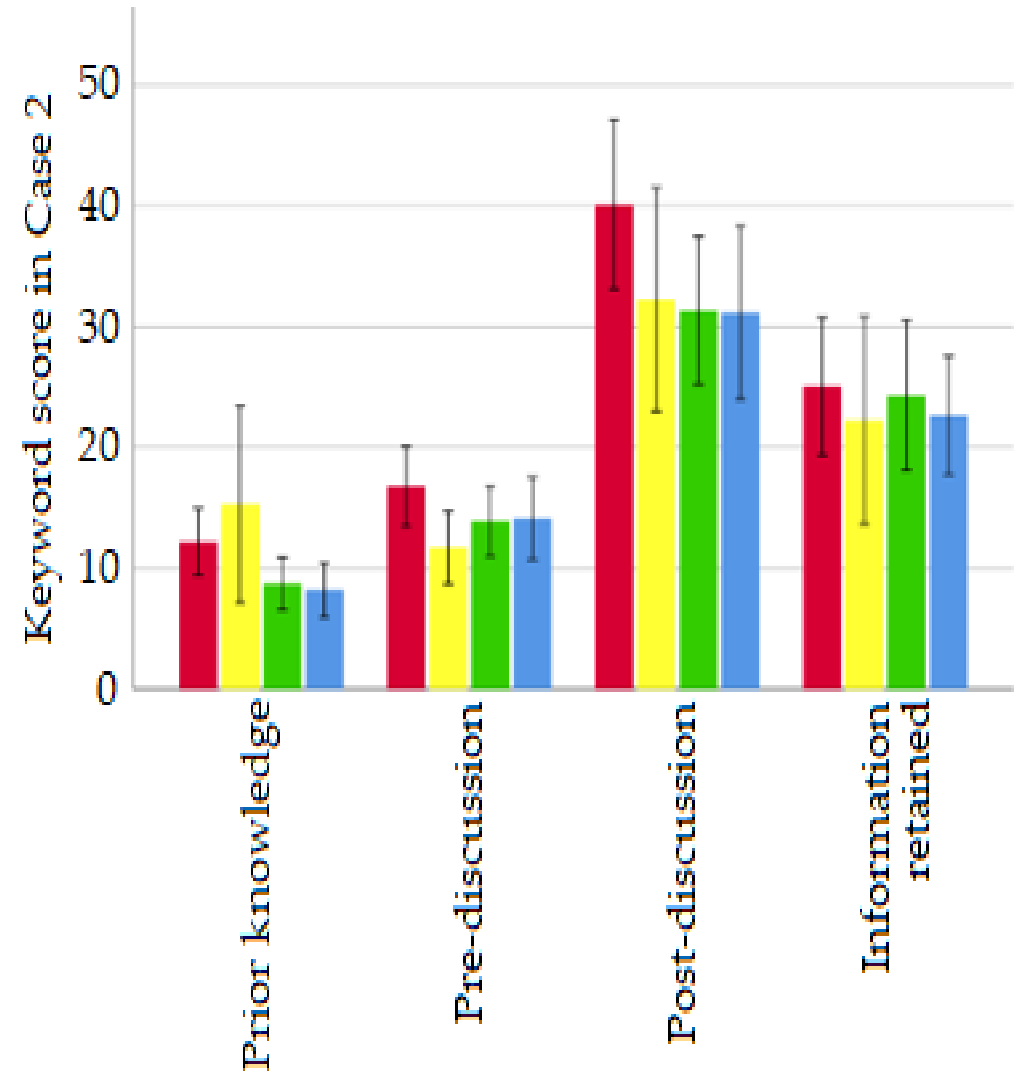
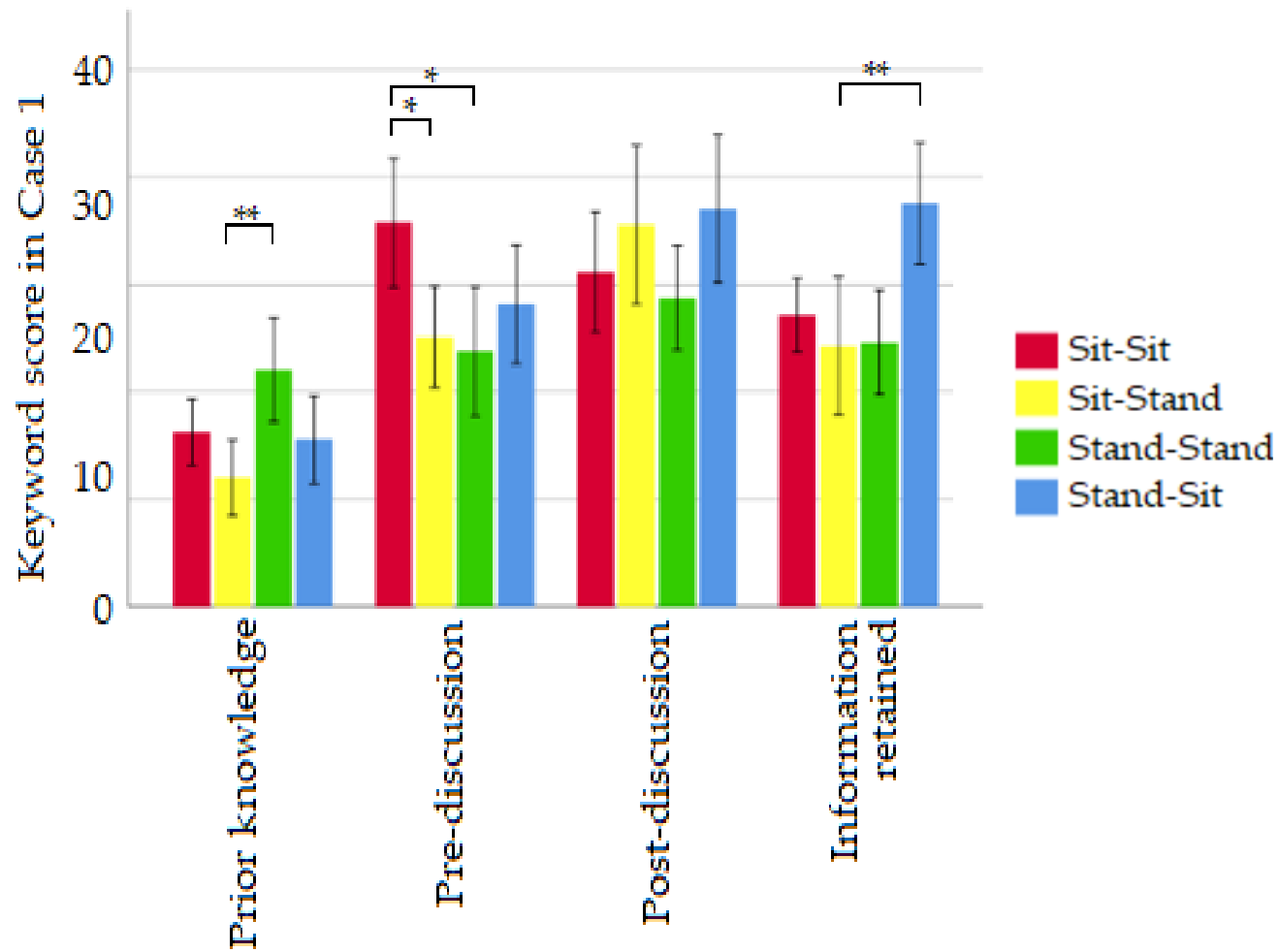


- Sit-Sit
- Sit-Stand
- Stand-Stand
- Stand-Sit



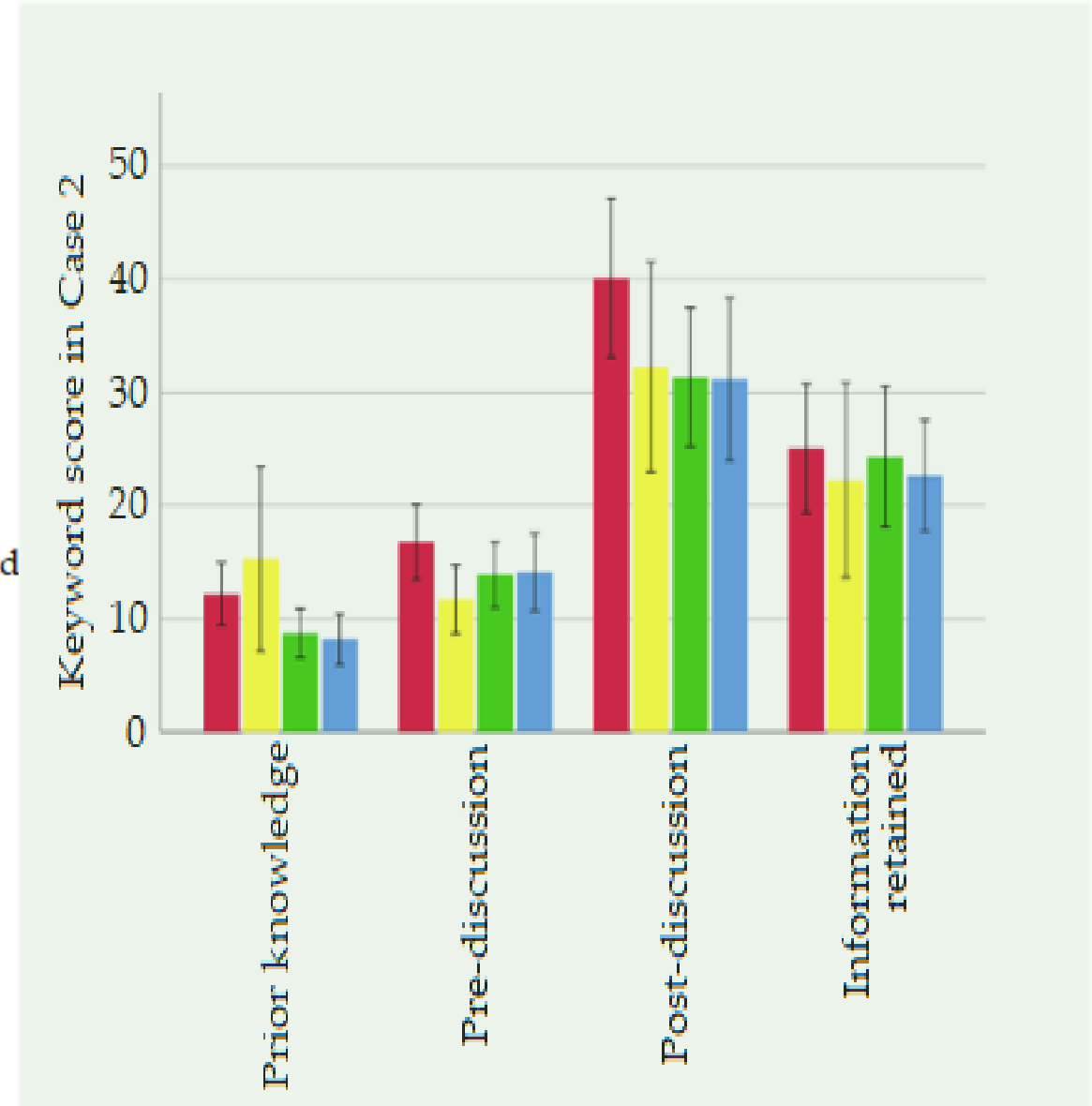
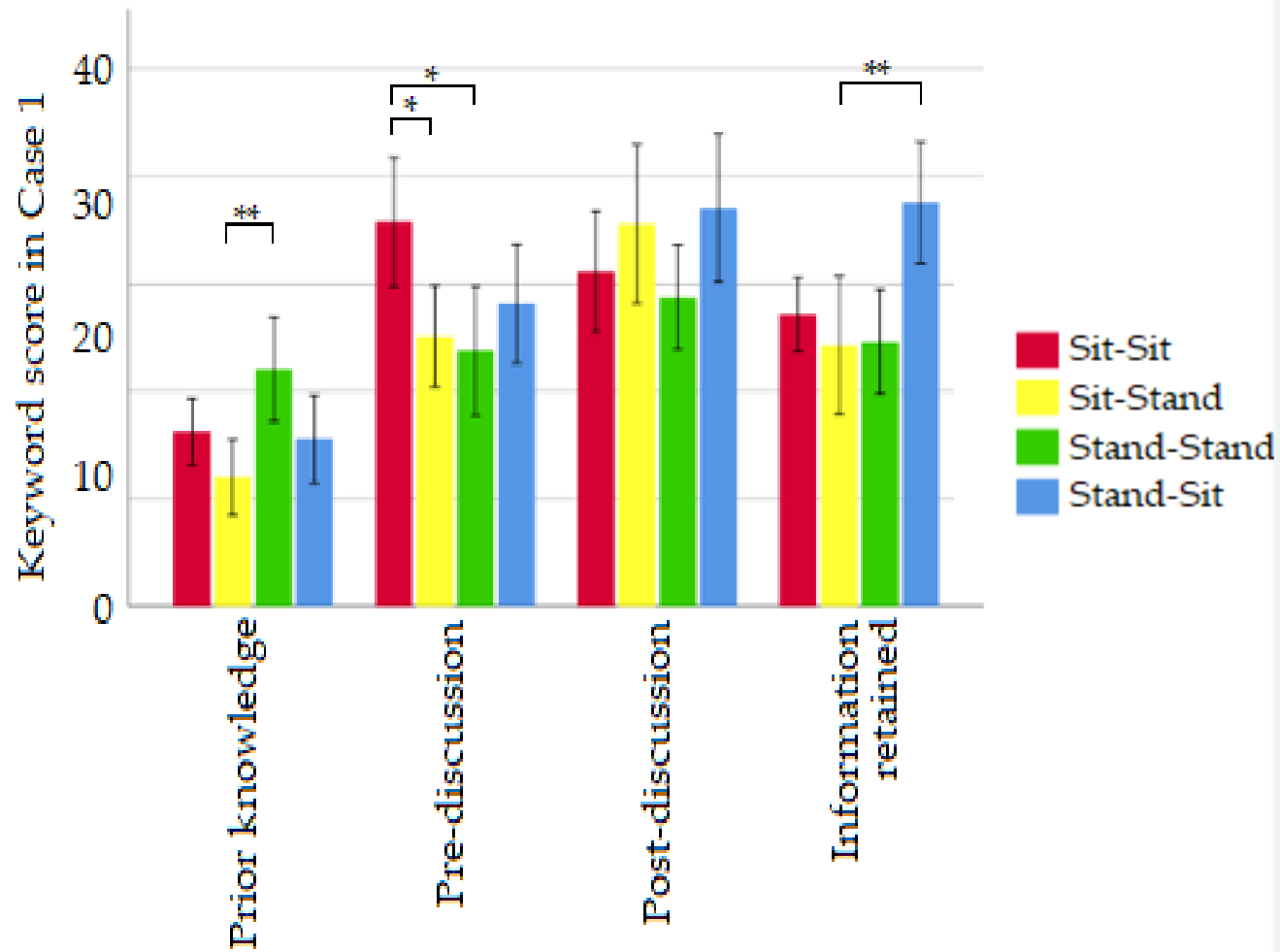


Concept map



Bar graph with 95% confidence interval error bars * $p < .05$; ** $p < .01$.

Concept map



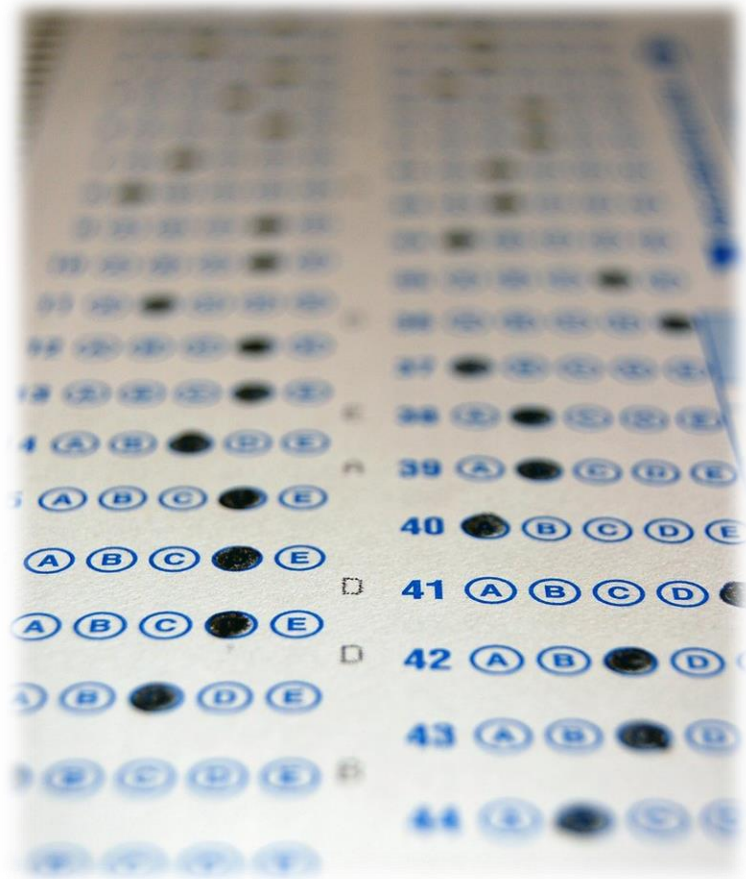
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Concept map

Sit vs. Stand: No group differences



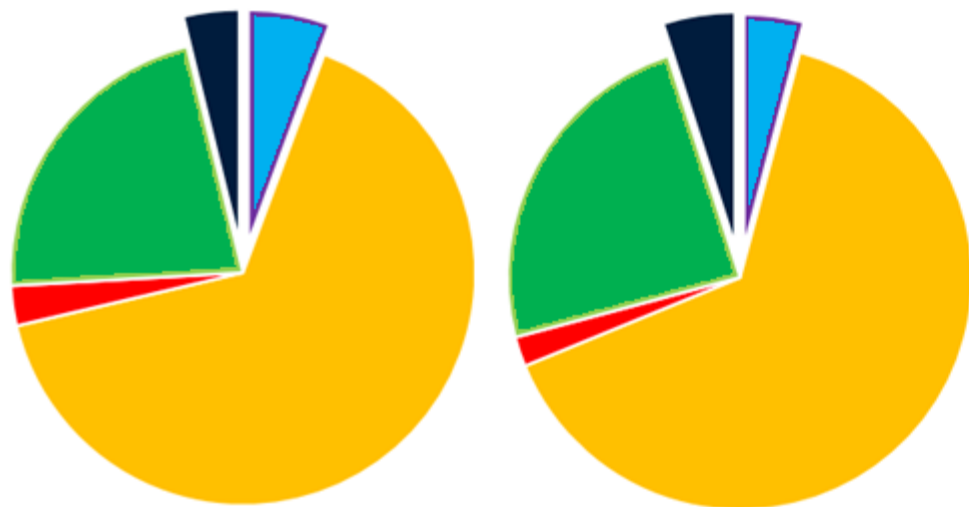
Exam grades



Average exam grades

Sit	5.8/10
1-	A B C D
2-	A B C D
3-	A B C D
4-	A B C D
5-	A B C D
6-	A B C D

Stand	6.5/10
1-	A B C D
2-	A B C D
3-	A B C D
4-	A B C D
5-	A B C D
6-	A B C D

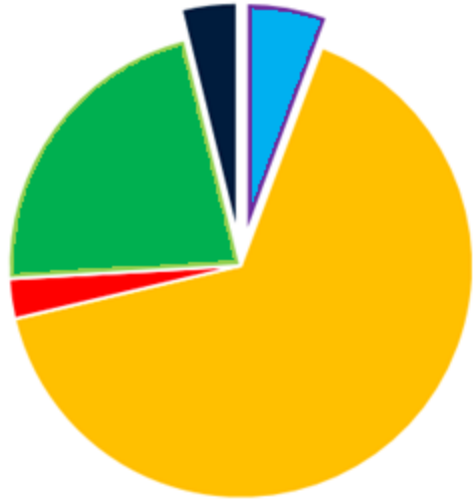
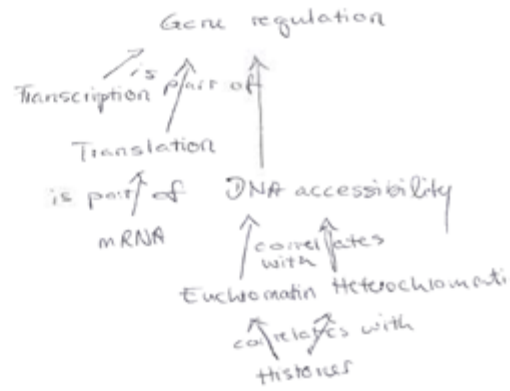


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Stand 6.5/10

1- A B C D

2- A B C D

3- A B C D

4- A B C D

5- A B C D

6- A B C D

Conclusions

Standing tutorial group meetings



Conclusions

Standing tutorial group meetings

- Less sitting, more physical activity



Conclusions

Standing tutorial group meetings

- Less sitting, more physical activity
- Learning is not affected



Take home messages

Stand for the students' right to an active lifestyle



Take home messages

Stand for the students' right to an active lifestyle

Students should be given the option to stand in educational (tutorial group) meetings at universities



Thank you

Contact details: hq.chim@maastrichtuniversity.nl

Relevant articles:

- Chim, H. Q., de Groot, R. H., Van Gerven, P. W., oude Egbrink, M. G., Erkens, R. H., von Rango, U., Broers, J.V.B., & Savelberg, H. H. (2021). The Effects of Standing in Tutorial Group Meetings on Learning: A Randomized Controlled Trial. *Trends in Neuroscience and Education*, 100156.
- Visschers-Pleijers, A. J., Dolmans, D. H., De Leng, B. A., Wolfhagen, I. H., & Van Der Vleuten, C. P. (2006). Analysis of verbal interactions in tutorial groups: a process study. *Medical Education*, 40(2), 129-137.
- Chim, H. Q., Van Gerven, P. W., de Groot, R. H., Oude Egbrink, M. G., Erkens, R. H., & Savelberg, H. H. (2021). The effects of standing tutorial meetings on physical activity behavior in undergraduates: A randomized controlled trial. *Physiology & Behavior*, 230, 113294.