A Randomized Comparison between Team Based Learning and Standard Lecture Format on Learning Outcomes

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BACKGROUND

Team-based learning (TBL) facilitates active learning and engagement. Studies comparing TBL to lecture show short-term learning outcomes are the same or better with TBL, including findings within our own curriculum. However, these trials had methodological weaknesses and often evaluated "soft" endpoints (e.g. self-reflections, confidence ratings, etc.). We adopted TBL as a unifying pedagogy for a 5-semester course sequence that was previously taught using lecture and punctuated lecture. To advance our understanding about how learning outcomes have been impacted in our own curriculum, and to address methodological weaknesses that limit utility of other studies, we proposed the following research question:

RESEARCH QUESTION

Are there significant differences in learning outcomes between an active learning pedagogy based in part on a concept of a "flipped classroom" (team based learning) as compared to a traditional or punctuated lecture pedagogy evaluated within a rigorous scientific construct?

METHODS

Randomized crossover design comparing TBL to punctuated lecture in a therapeutic elective course involving 2nd year pharmacy students with prior TBL experience. All instructors had at minimum 4 years of experience teaching TBL.

|	Group 1 Tuesday (TBL → Lec)	Group 2 Thursday (Lec → TBL)
1	Topic 1 - TBL	Topic 1 - Lecture
2	Topic 2 - TBL	Topic 2 - Lecture
3	Topic 3 - TBL	Topic 3 - Lecture
4	Exam 1 (12 application and 12 recall questions)	
5	Topic 4 - Lecture	Topic 4 - TBL
6	Topic 5 - Lecture	Topic 5 - TBL
7	Topic 6 - Lecture	Topic 6 - TBL
8	Exam 2 (12 application and 12 recall questions))	
9	CRLT Focus Groups & Self-Reflection	
10	Exam Retake (24 application and 24 recall questions) – Retest 3-6 months after course completion - TBD	

Other measurements: Student Survey; Student Reflection; Student Feedback (Small Group Instructional Diagnosis Process)

## RESULTS

Thirty students participated in the course: 13 in Group 1; and 17 in Group 2 .

% Correct Answers Exam 1 and 2 - Combined Group 1 and 2			
	TBL	Lecture	P value
Application	88.1 ± 11.7%	83.1 ± 11.5%	0.14
Recall	90.3 ± 9.6%	86.9 ± 8.4%	0.15
Application & Recall Combined	89.2 ± 10.6%	85 ± 10.2%	0.03

"I am confident in providing therapeutic recommendations on topics in this course following TBL/Lecture sessions" (N=30)
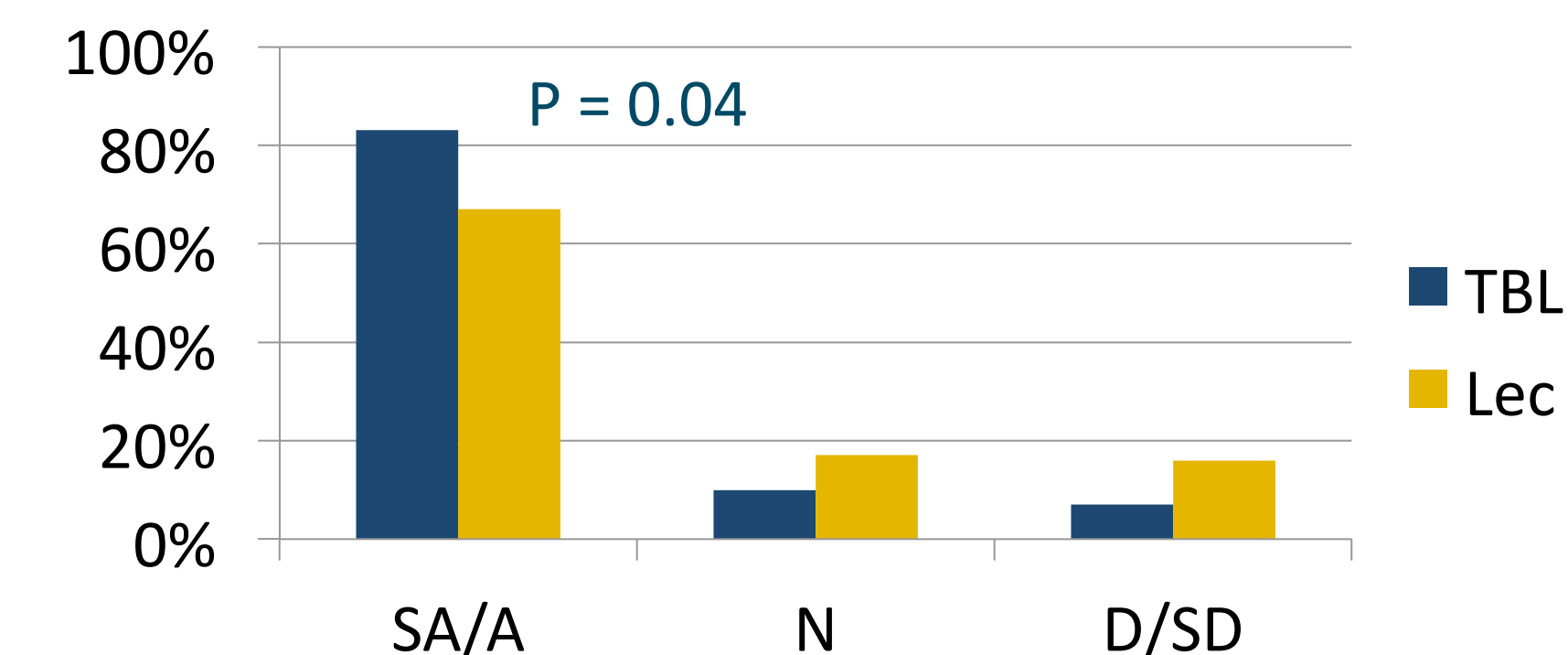
"I prefer TBL to Lecture" (N=30)
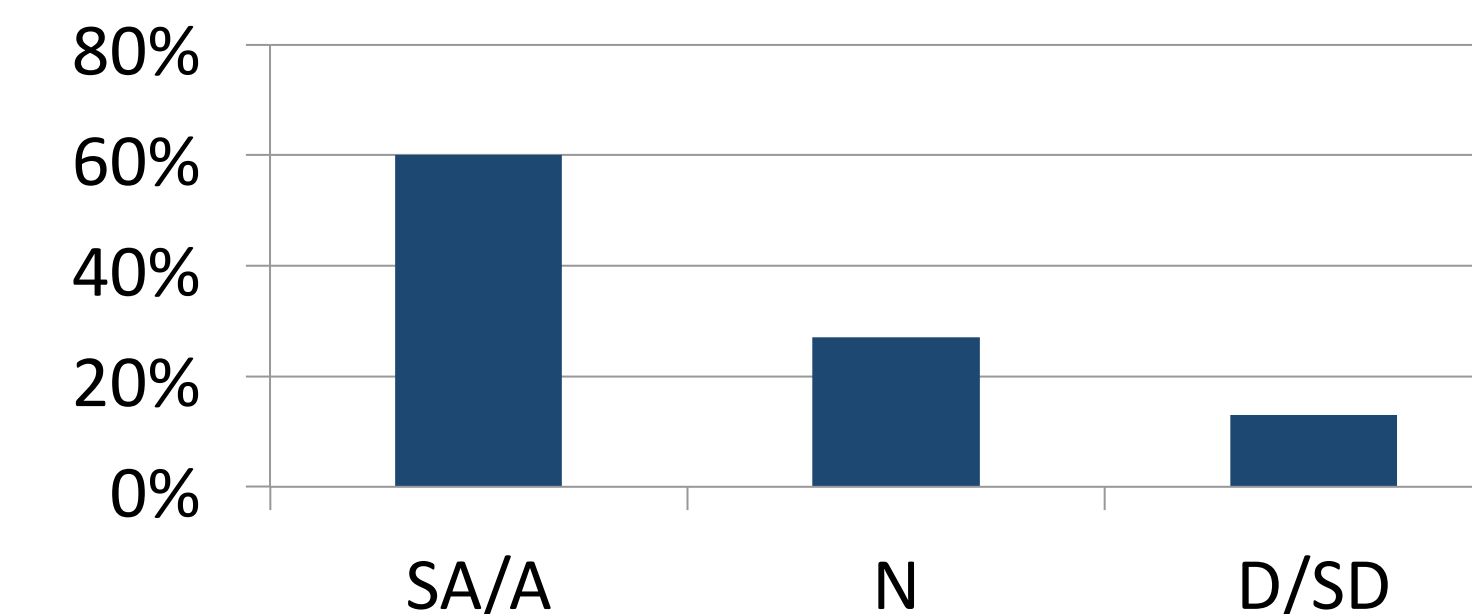
CONCLUSIONS

Short term learning outcomes were similar or better with TBL compared to lecture. Students tend to prefer TBL and had a higher level of confidence in providing therapeutic recommendations. Analysis of short- and long-term outcomes is ongoing.