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# Student Perception of the Impact of Audience Response Software in a Team-Based Learning Self-Care Course

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## Objectives

- To evaluate student perceptions of the audience response systems (ARS) technology
- To compare students' assessment of the use of ARS technology with their performance

## Background

- An ARS allows students to electronically answer a question posed to the class with the use of "clickers", remote electronic devices, or software that can be accessed online or installed as a smartphone app
- Although audience response systems have been utilized in medical education for decades, they have become more advanced and popular within the last 10 years<sup>1-3</sup>
- A 2011 survey of schools/colleges of pharmacy showed 88.8% of pharmacy institutions use some type of ARS<sup>4</sup>
- Across multiple disciplines, instructors have reported ARSs to increase: student engagement<sup>5</sup>, class participation<sup>6</sup>, perception of learning material<sup>7</sup>, performance on examinations and interest in a course<sup>8</sup>
- Researchers have reported ARSs promote interactivity and initiation of discussion, thus enhancing traditional lectures<sup>9</sup>
- However, evidence evaluating audience response systems (ARS) used in team-based learning (TBL) compared to traditional classes is limited

## Methods

- TBL was implemented in the required self-care course (PP2120: Introduction to Pharmaceutical Care: Non-prescription drugs) at St. Louis College of Pharmacy, and an audience response system was implemented in Fall 2015.
- The weekly course schedule was as follows:
  - The course administrator entered all case questions into the ARS prior to the class period.
  - Students would prepare responses to cases during the team based portion of the class. The students would then input their answers into the ARS system.
  - The students could then see how each group answered the question in real time.
  - Faculty could also see the variety of responses input by the students and identify teaching points based on student input.
  - This TBL approach using the ARS schedule was repeated weekly throughout the semester.
- At the conclusion of the course, a web-based survey was administered to students.

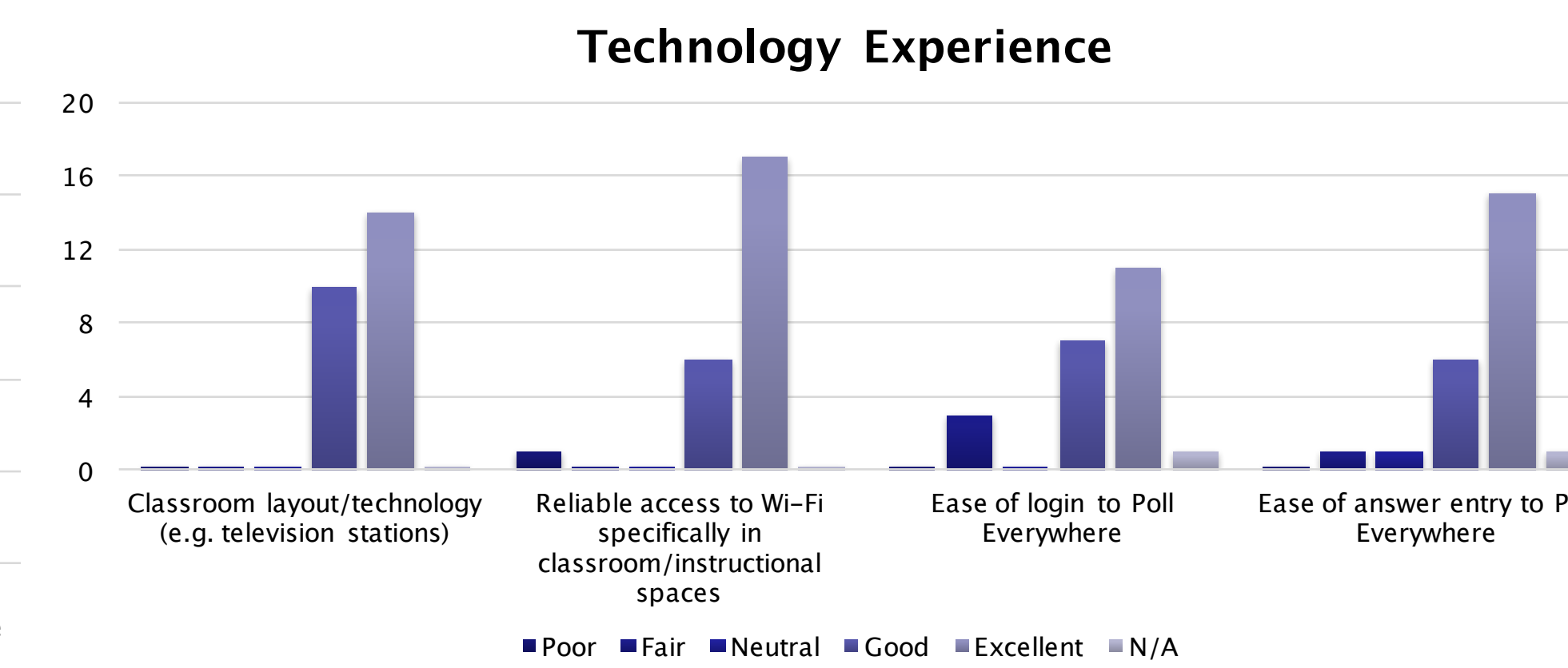
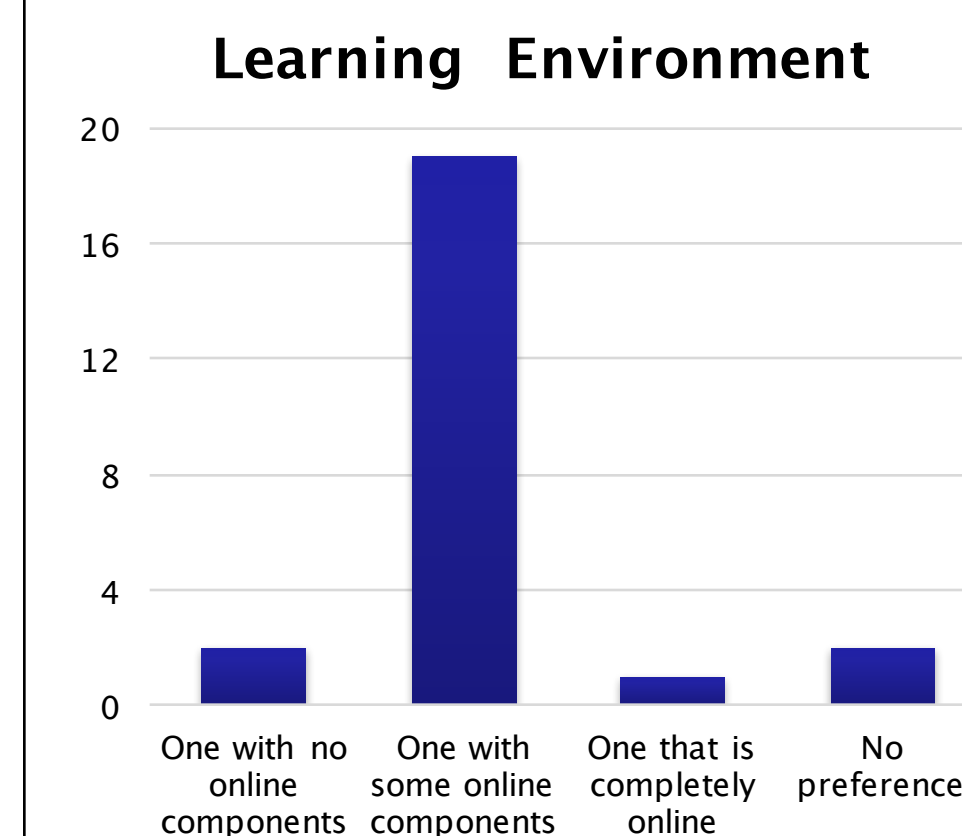
## Participant Characteristics

- Of the 29 students who successfully completed the course, 23 (79%) completed the survey. Student response to the audience response technology was generally favorable.

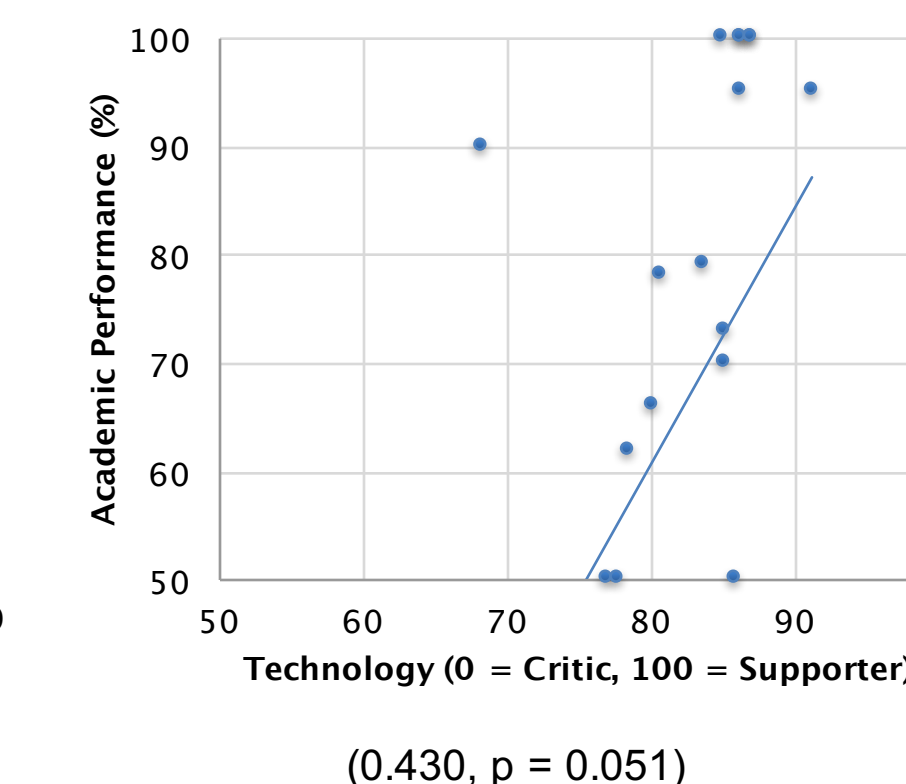
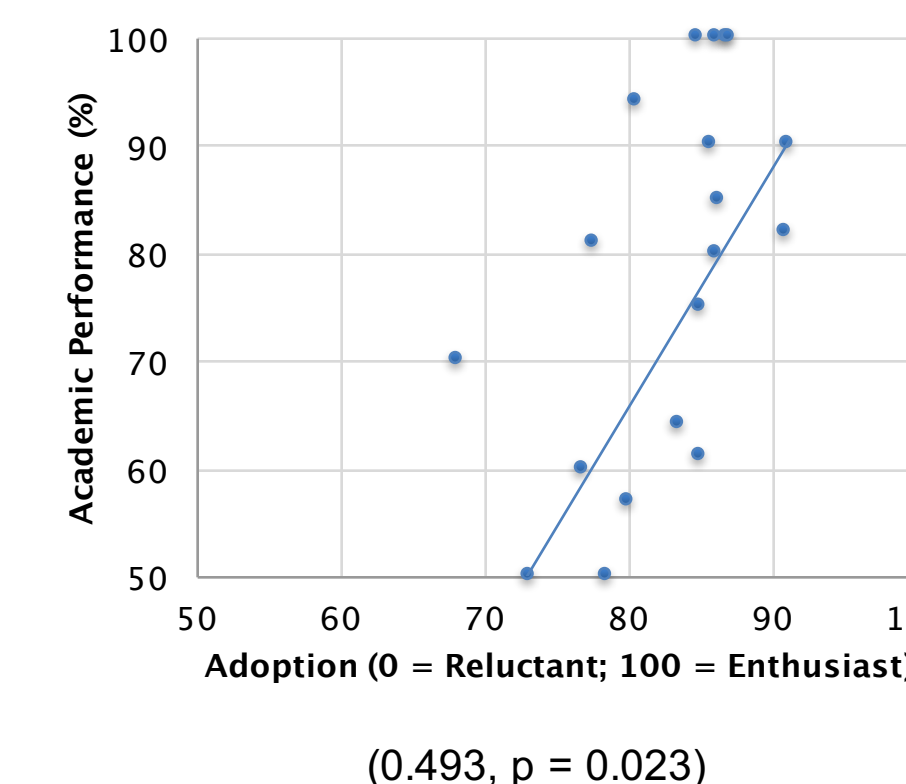
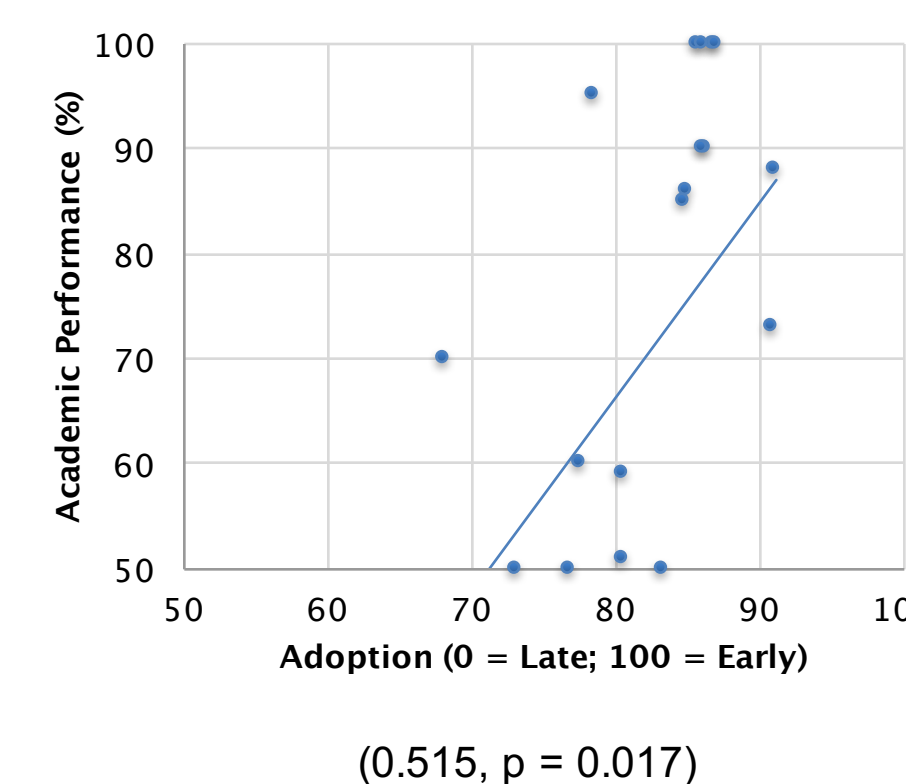
Participant Characteristics	All Respondents n(%) (n=24)		
<b>Gender</b>		<b>Ethnic Background</b>	
Male	10 (42)	White	17 (71)
Female	14 (58)	Hispanic	1 (4)
		Asian/Pacific Islander	6 (25)
<b>Terminal Degree Goal</b>		Other	1 (4)
Pharm.D.	23 (96)		
Other	1 (4)	<b>Residence</b>	
		On Campus	2 (8)
<b>Academic Status</b>		Off Campus	22 (92)
Full-Time	23 (96)		
Part-Time	1 (4)		

## Results

Participant Responses (n = 24)	Somewhat agree	Strongly agree	% Agree
1 I get more actively involved in the case response portion of class due to Poll Everywhere	11	10	87.5%
2 I get more actively involved in the muddiest points portion of class due to Poll Everywhere	7	11	75.0%
3 My learning was enhanced in the case response portion of class due to Poll Everywhere	6	11	70.8%
4 My learning was enhanced in the muddiest points portion of class due to Poll Everywhere	11	8	79.2%
5 Technology (e.g. Poll Everywhere) makes me feel more connected to what's going on at the college/university.	6	11	70.8%
6 Technology (e.g. Poll Everywhere) makes me feel more connected to my team members.	9	7	66.7%
7 Technology (e.g. Poll Everywhere) makes me feel connected to instructors.	7	11	75.0%
8 The faculty seemed to understand how to properly use the poll everywhere software	12	8	83.3%
9 The ability to respond to the polls using a device other than your laptop computer was a valuable feature of Poll Everywhere	2	14	66.7%
10 Poll Everywhere visuals made it easier to understand the entire classes' response to case questions	5	18	95.8%
11 Poll Everywhere would be useful in other pharmacy courses in the curriculum	8	14	91.7%



## Technology/Academic Performance Relationship



## Discussion

- This is the first study to measure the impact of ARS with TBL implementation in a self-care course.
- Understanding student perceptions of an ARS within a TBL course is vital.
- Study results are consistent with previous research showing increased student involvement, participation, and enhanced learning, when utilizing ARS.
- Academic performance is positively correlated with both early adopters and enthusiasts of technology and both were statistically significant.
- Limitations of this study include:
  - Small sample size
  - Limited external validity
  - The self-care course is team taught; Different faculty taught the class from week to week. However, the course coordinators (both investigators) attended each class session to ensure consistency of implementation

## Implications

- ARS data can be used to help implement TBL in pharmacy school curricula.
- Further research can be performed to link student adoption of technology to performance in courses that implement ARS.
- Further research can also review faculty perceptions of ARS within TBL courses.

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## Disclosures

The authors have no financial or any other conflicts of interest.