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# Analysis of Student Performance Outcomes Using Virtual Dispensing Exercises

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# Analysis of Student Performance Outcomes Using Virtual Dispensing Exercises

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## Objective

- The objective of this study was to compare performance outcomes between PY1 and PY2 students on an identical exercise required during their final objective structured clinical exam (OSCE).

## Background

- MyDispense, a community pharmacy simulation program, was recently implemented into the new Patient-centered Care Experience (PaCE) course at University of Kentucky College of Pharmacy.

- The PaCE course incorporates PY1 and PY2 students, aiming to supplement didactic learning with a simulated patient encounter through the virtual dispensing system. As students progress throughout their coursework, it is expected that greater experience will lead to higher performance outcomes when PY1 and PY2 outcomes are compared.

- MyDispense is a simulated learning environment in multiple colleges of pharmacy in the USA where students can develop and practice the necessary skills to accurately and safely dispense medications to patients in the community pharmacy setting.[1] Exercise types include over the counter medication counseling, verification of prescriptions, and dispensing exercises with various drug-related therapy problems.

## Methods

- MyDispense was implemented in the Patient-centered Care Experience (PaCE) simulation sequence at the University of Kentucky College of Pharmacy. Students continue to complete various exercises as they progress through their coursework during the P1 through P3 years, with a final objective structured clinical exam at the end of each semester of coursework to gauge progress.

- 285 students completed the OSCE, (148 PY1; 137 PY2). Anonymized data was assessed using a t-test to identify differences in PY1 and PY2 performance including variables measuring the medication use process, such as patient and prescriber communication, time to complete the exercise, and correct outcome.

- This study was designed to identify whether PY2 students would have superior outcomes to PY1 students due to increased exposure in patient encounters and medication therapy. Analysis was conducted using Pearson Correlation with SPSS (IBM Corporation, Armonk, NY, Version 23).
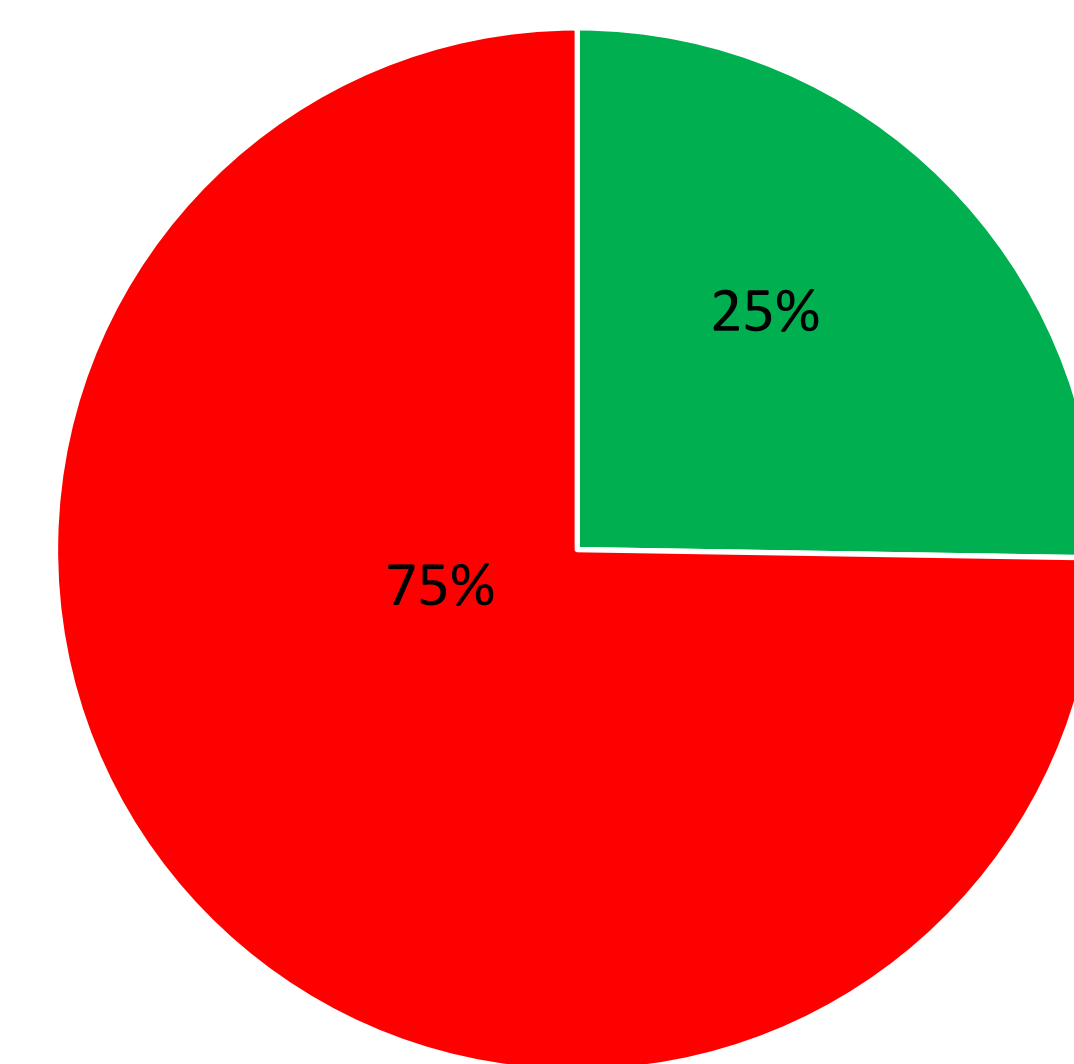
## Results

**Correct Outcome Selected - PY1**

25% / 75%

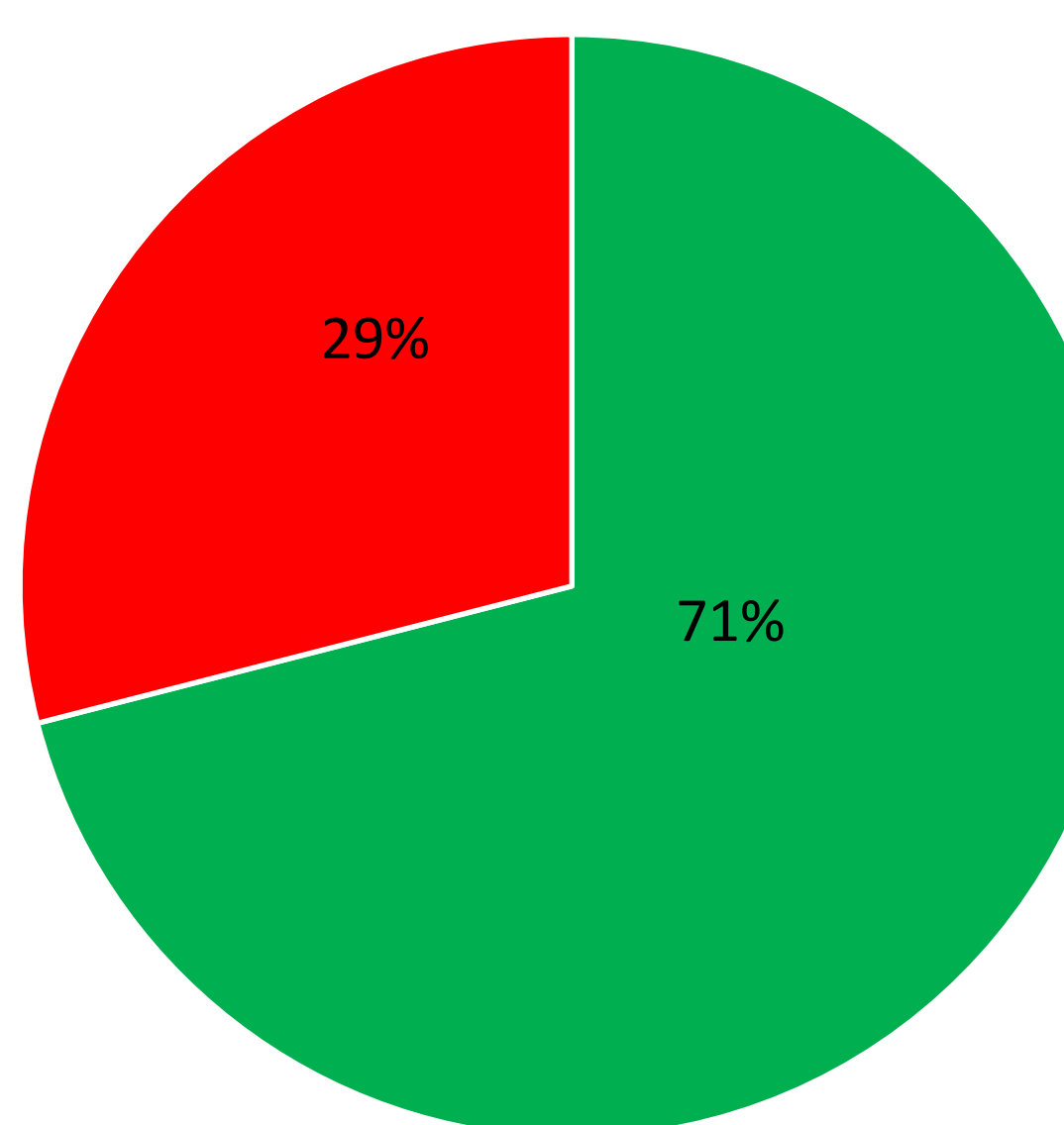Figure 1 — ■ Correct Outcome ■ Incorrect Outcome

**Correct Outcome Selected - PY2**

29% / 71%

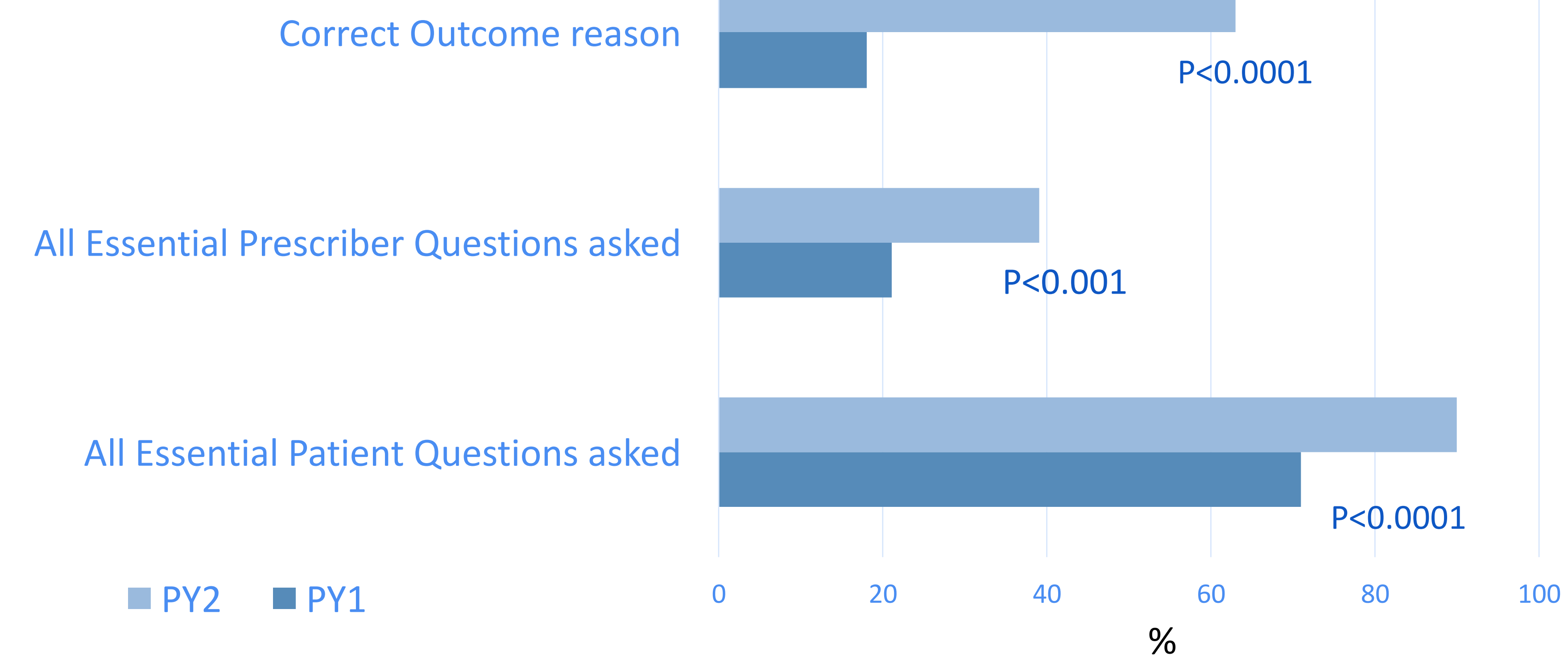Figure 2 — ■ Correct Outcome ■ Incorrect Outcome

Figure 3 — PY1 vs PY2 Outcome Variables

- Correct Outcome reason — $P < 0.0001$
- All Essential Prescriber Questions asked — $P < 0.001$
- All Essential Patient Questions asked — $P < 0.0001$

■ PY2 ■ PY1 — %

Table 1

|  | PY2 | PY1 | P-value |
|---|---|---|---|
| Average # Essential Prescriber Questions Asked | 1.09 | 0.53 | <0.0001 |
| # of Do Not Dispense Reasons Selected | 1.2 | 0.5 | <0.0001 |
| Average # Potential Prescriber Questions Asked | 1.77 | 1.4 | =0.041 |
| Average time per exercise (secs) | 411 | 328 | <0.001 |

## Results

**Overall, PY2 students reached the accurate outcome with correct rationale significantly more often than PY1 students.**

**Although almost half of PY1 students did call the doctor at least one time, only 25% still selected the corrected outcome.**

Figure 4 — Number of Prescriber Calls Per Class

# Calls Made (y-axis): 17, 9, 5, 4, 3, 2, 1, 0
# of Students (x-axis): 0 to 100

■ PY1 ■ PY2
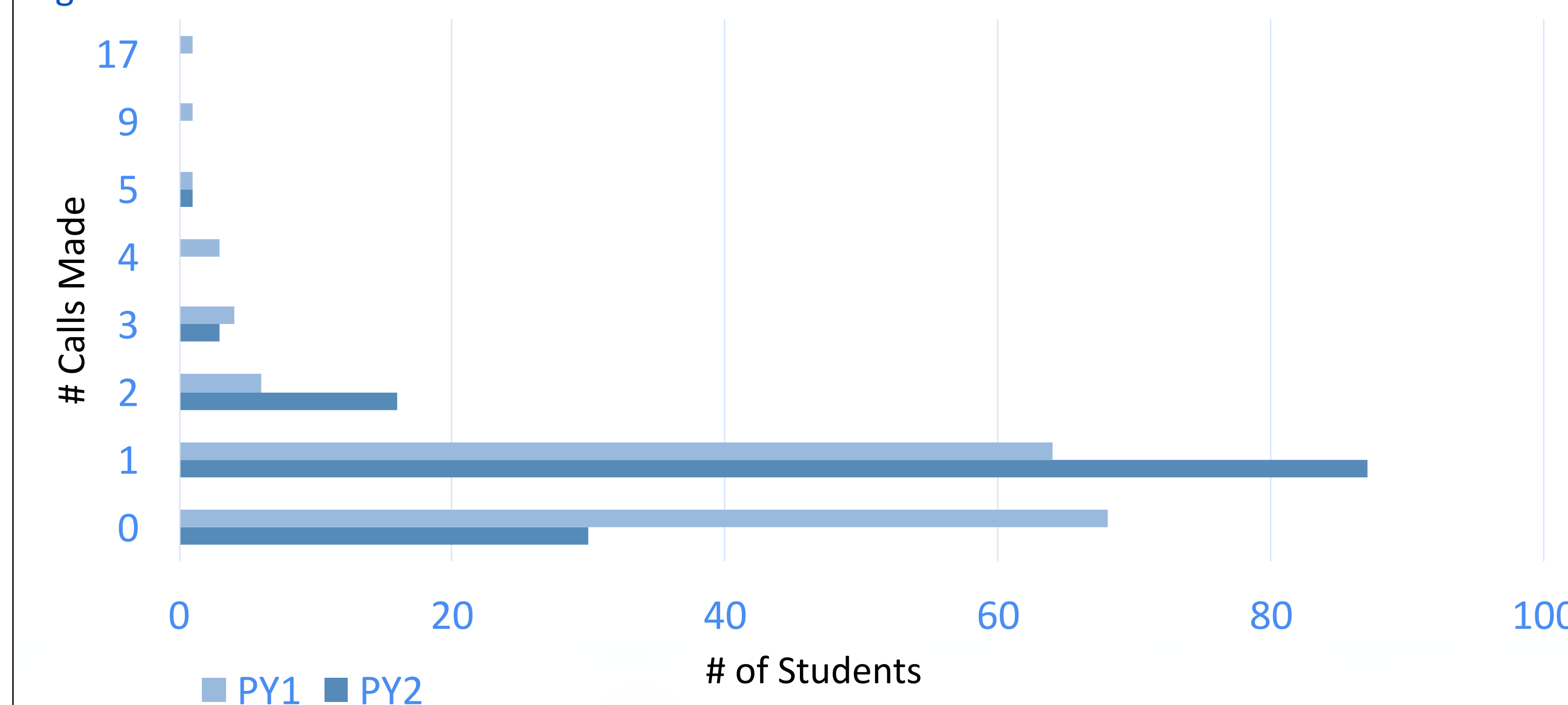
## Screenshots
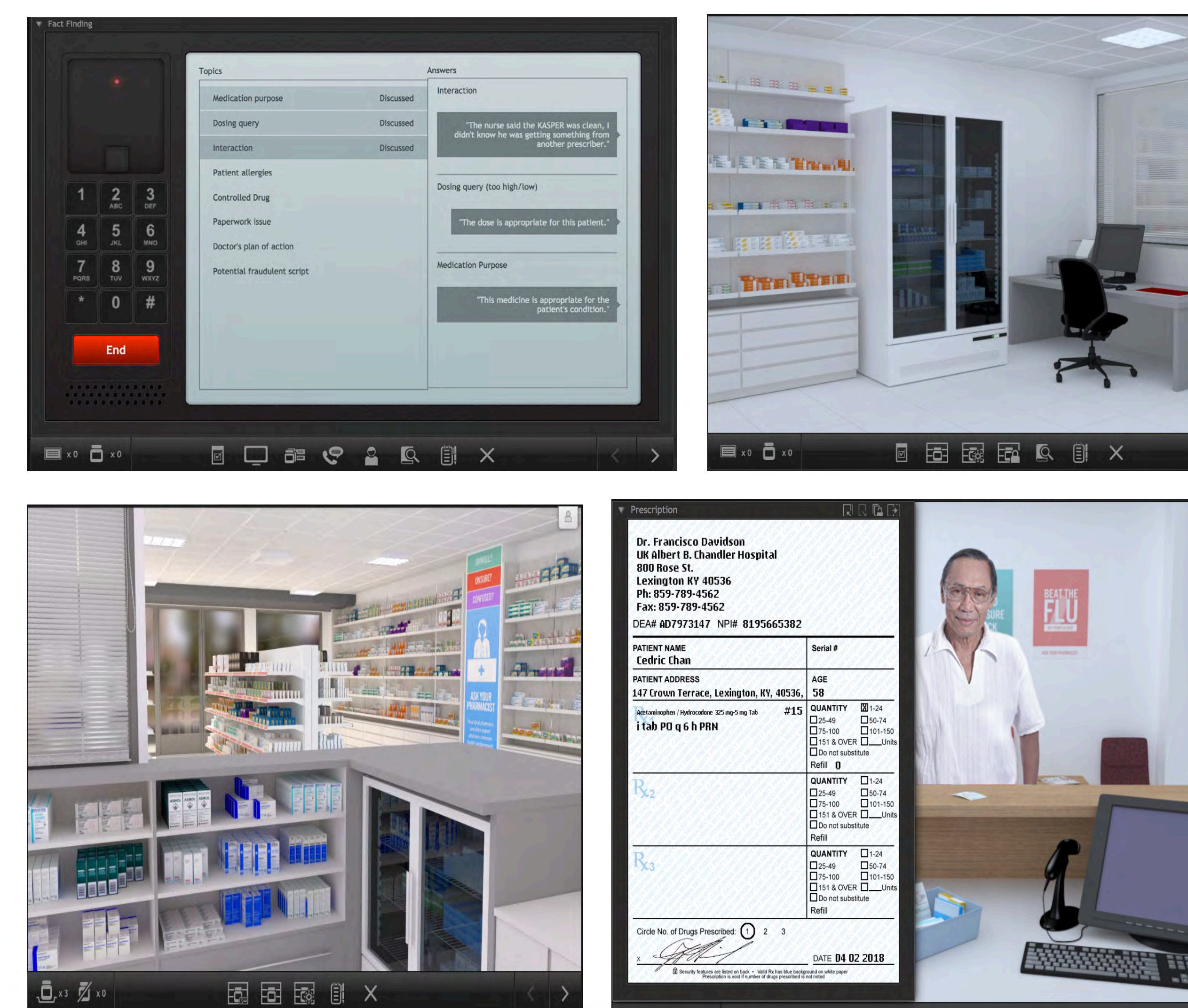


## Discussion

- Variables essential to the medication use process such as patient fact finding, prescriber fact finding, and accurate outcome and rational were significantly higher in the PY2 cohort.

- Greater exposure to controlled prescriptions and pharmacy dispensing laws in the PY2 cohort was thought to lead to higher performance.

- PY2 students on average, asked a significantly greater amount of necessary prescriber questions, needed to reach the correct outcome (1.09 vs. 0.53), and spent a significantly greater amount of time per exercise (411 vs. 328 seconds), likely due to more fact finding from both patient and prescriber.

- Increased exposure to similar exercises in the PY2 cohort was a limitation to this study design. Exercise design by the study investigators was another limitation to the study.

## Implications

- Enhanced understanding of controlled prescription dispensing and pharmacy law would be beneficial in the successful completion of all aspects of this exercise type.

- The implementation of exercises and didactic coursework regarding controlled prescriptions earlier on in the pharmacy curriculum may provide a better comparison of student performance in the future.

- Further studies may be warranted to identify any correlation between MyDispense performance outcomes and experiential education performance outside of the virtual system.

## References

1. Ferrone M, Kebodeaux C, Fitzgerald J, Holle L. Implementation of a virtual dispensing simulator to support US pharmacy education. Currents in Pharmacy Teaching and Learning. 2017 Jul 1;9(4):511-20.

## Acknowledgements