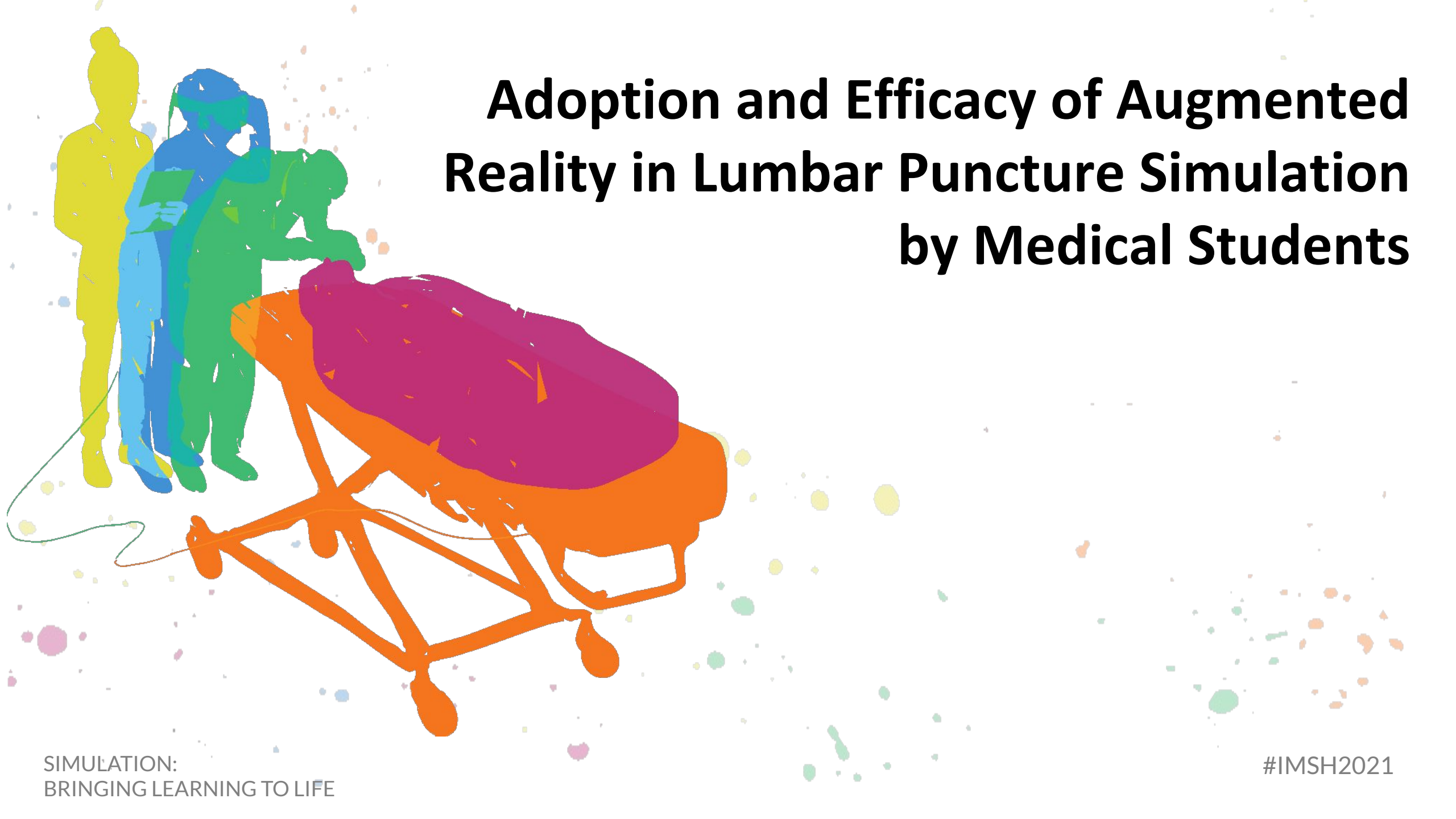# Adoption and Efficacy of Augmented Reality in Lumbar Puncture Simulation by Medical Students
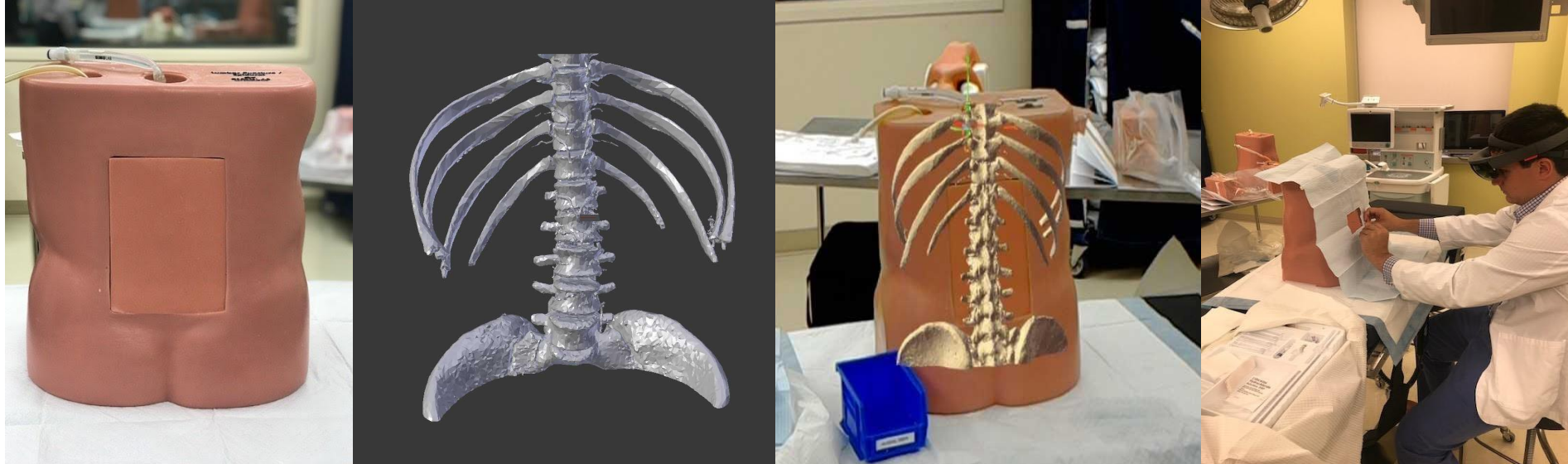
WELCOME

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Tulane-Ochsner Pediatrics Residency Program, PGY-2
University of Queensland-Ochsner Clinical School Class of 2018
University of Queensland-Ochsner 2019 Post-Graduate Research Fellow

Our Study

Materials:

1. SimuLab Lumbar Puncture Trainer

2. Microsoft HoloLens

3. 20-gauge spinal needles

Study Subjects:

1. 3rd and 4th year medical students

2. No previous experience with performing LP (either on live patient or simulation model)

Procedure and Data Collected

Procedure:

1. Volunteers given pre-study questionnaire

2. HoloLens Tutorial

3. Lumbar puncture training video

4. Attempt 1
   - Randomly assigned to control (no AR) or intervention (AR) group to start

5. Attempt 2
   - If control group on attempt 1, used AR
   - If intervention group on attempt 1, performed without AR

6. Post-Study Questionnaire emailed to volunteers

Data Collected:

Main Outcomes Measured:
- Average number of sticks required for successful LP
- Expected average distance from target

Secondary Outcomes:
- Expected maximum number of sticks
- Changes in attitudes concerning ability to perform LP

Other Data Collected (for possible future analyses)
- Time required for successful LP
- Head/gaze tracking
- Demographic data

Results

Average Number of Sticks

Treatment	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
A		1.4706	0.9217	2.0195	1.0676	0.7951	1.6248
B		1.7059	0.5741	2.8377	2.2013	1.6394	3.3502
Diff (1-2)	Pooled	-0.2353	-1.4439	0.9733	1.7299	1.3912	2.2882
Diff (1-2)	Satterthwaite	-0.2353	-1.4624	0.9918			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	32	-0.40	0.6943
Satterthwaite	Unequal	23.132	-0.40	0.6953

Expected Average Distance From Target
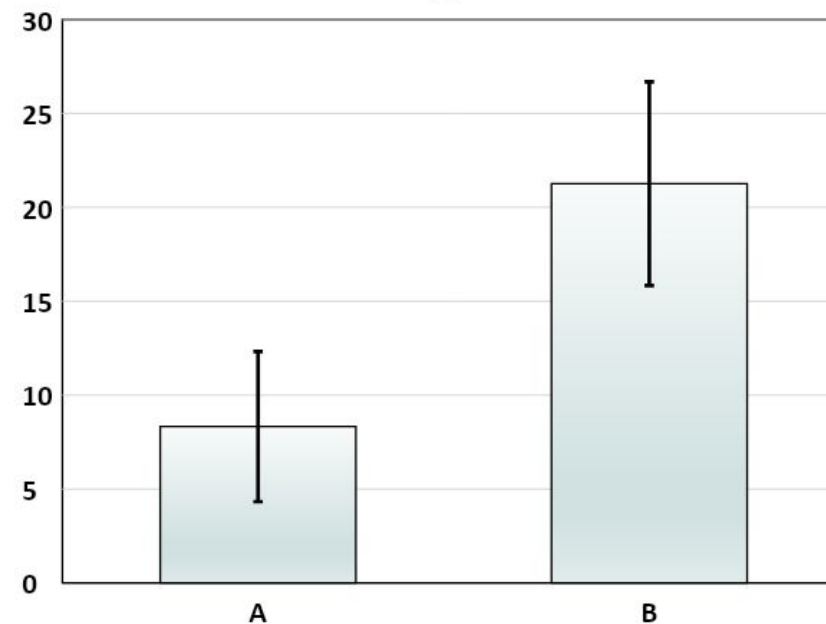
	Least Squares Means								
Effect	Treatment	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Treatment	A	8.3276	1.9928	52	4.18	0.0001	0.05	4.3288	12.3264
Treatment	B	21.2600	2.7048	52	7.86	<.0001	0.05	15.8324	26.6876

Results
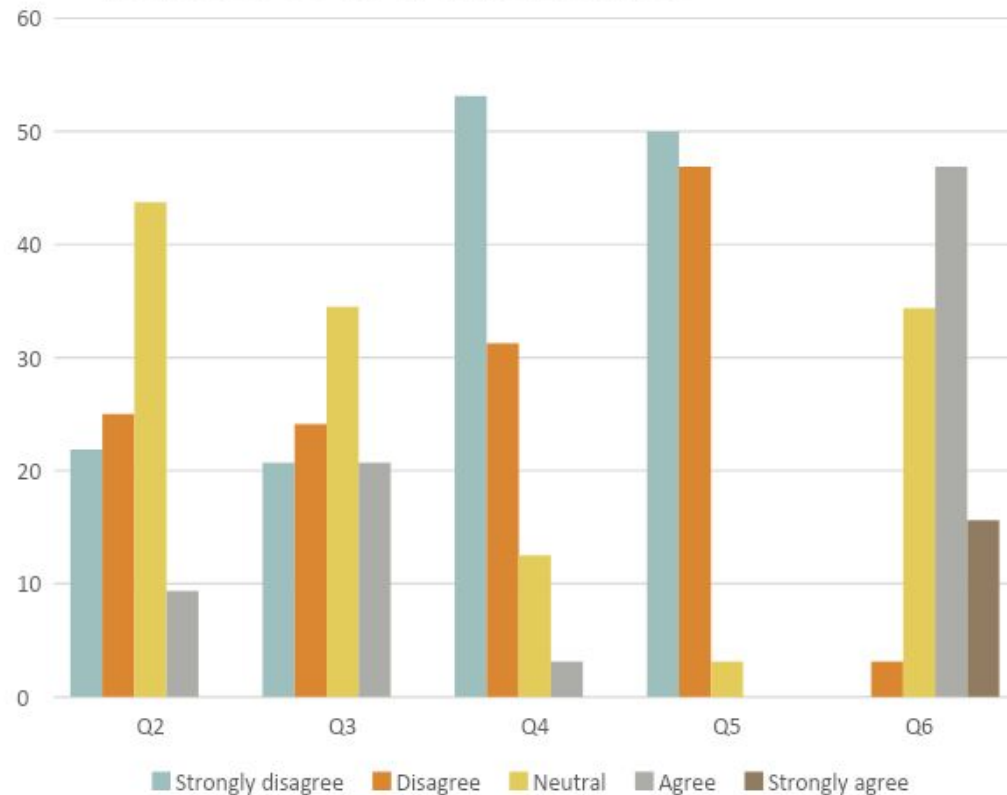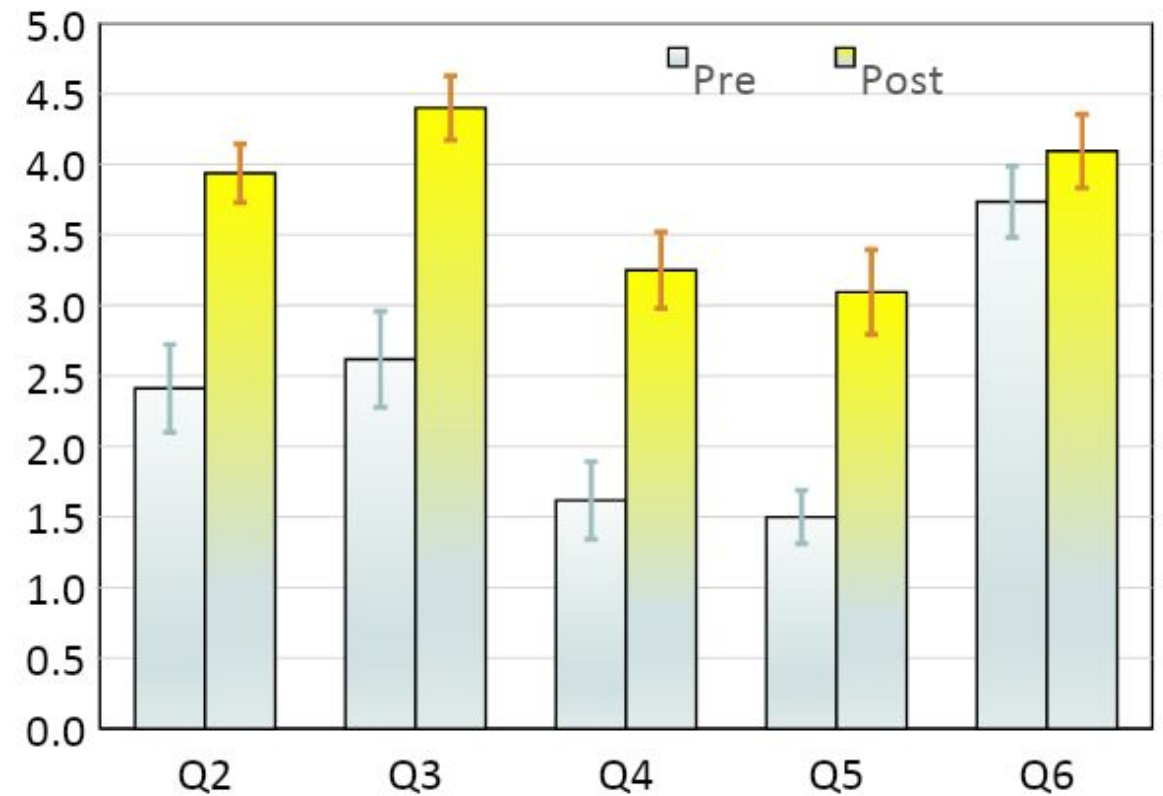
QUESTIONS?

SIMULATION:
BRINGING LEARNING TO LIFE