

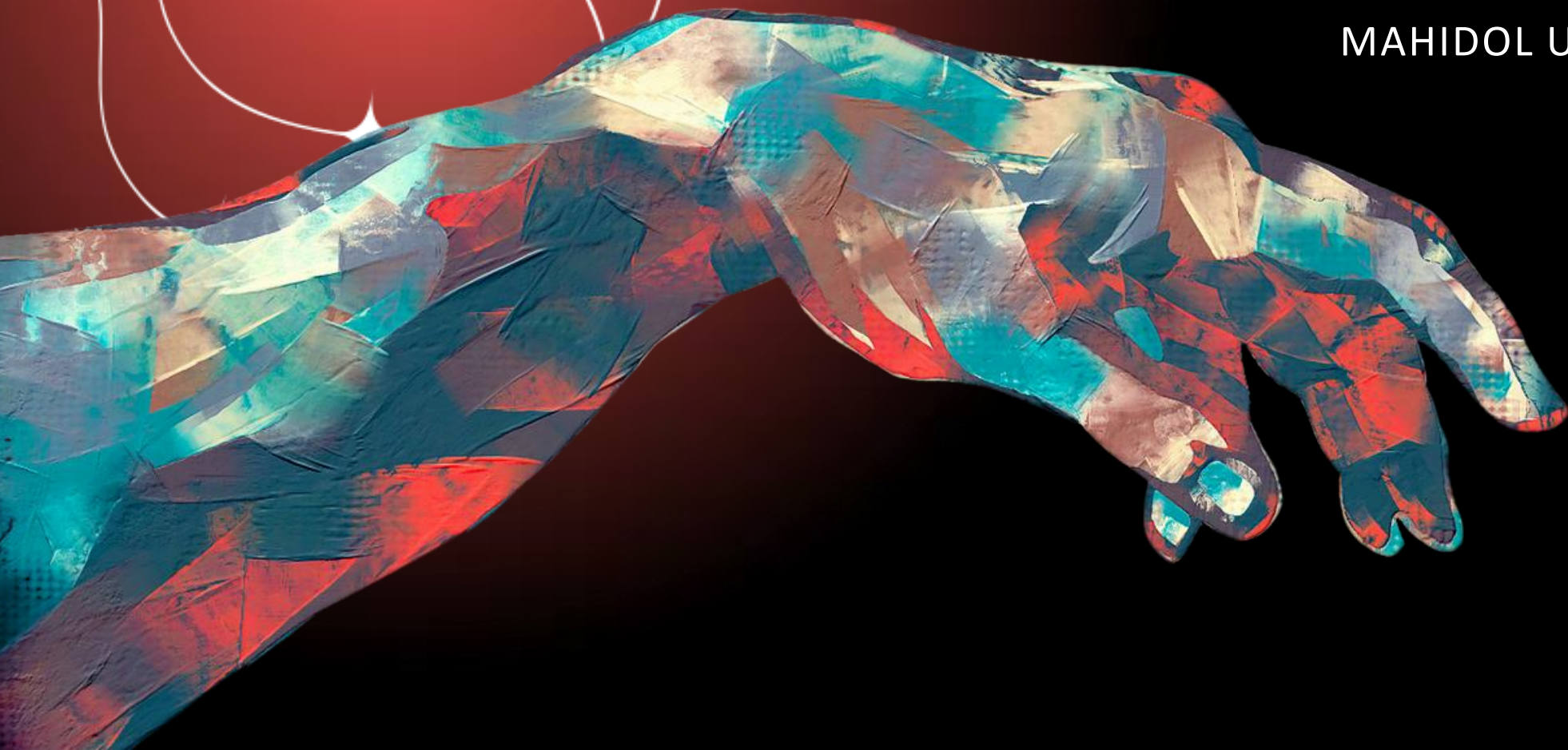
BEST PRACTICE

“

Building a Simulation Center in Thailand

”

TEERAPAT YINGCHONCHAROEN MD. FACC, FESC
RAMATHIBODI HOSPITAL
MAHIDOL UNIVERSITY





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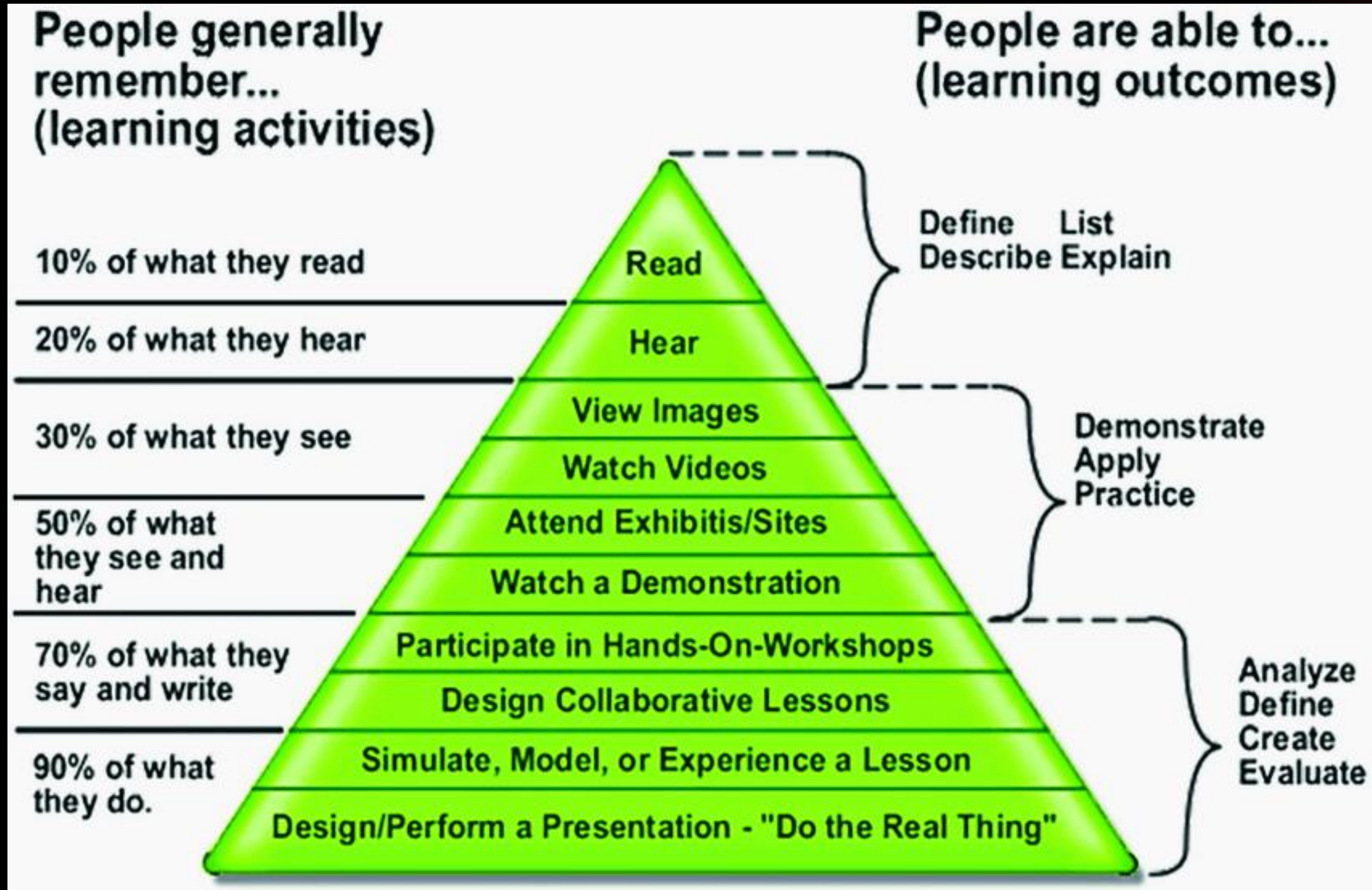
“ Why Simulation ”

**I HEAR AND I FORGET.
I SEE AND I REMEMBER.
I DO AND I UNDERSTAND.**

— CONFUCIUS




Dale's cone of experience






Advantages of simulation

- Avoid by-chance learning
 - Safe environment, freedom to make mistakes
 - Learning experience can be customized
 - Detailed feedback and evaluation
 - Patients' safety
- 



Challenges

- Not real, simulation resistance
 - Is simulation needed ? other methods?
 - What education domains will the simulation address ?
 - Cost-effectiveness?
 - Able and available faculty ?
- 

Why Build a Simulation Center in Thailand?






RESEARCH

Open Access

Simulation-based medical education in Thailand: a cross-sectional online national survey



Polpun Boonmak¹ , Suwannee Suraseranivongse² , Ngamjit Pattaravit³ , Suhattaya Boonmak^{1*} ,
Tachawan Jirativanont², Tripop Lertbunnaphong⁴, Rajin Arora⁵, Jittiya Watcharotayangul⁶, Intanon Imsuwan⁷,
Panithan Kwangwaropas⁸ and Borwon Wittayachamnankul⁹

Obstacles to effective simulation-based medical education implementation in Thai medical schools

Administrator data (N = 15; n (%))

Lack of administration system

No administration system	9 (60.0)
Insufficient financial support	5 (33.3)

Space shortages

Controlled room	9 (60.0)
Lecture room	7 (46.7)
Debrief room	6 (40.0)
Office room	6 (40.0)

No simulation center	6 (40.0)
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No simulation center in 6/15 medical school (49%)

Observation room	8 (53.3)
Training room	7 (46.7)
Storage room	6 (40.0)

Obstacles to effective simulation-based medical education implementation in Thai medical schools

Simulator shortages

Screen-based simulation	12 (80.0)	High fidelity mannequins	10 (66.7)
Cadaver	7 (46.7)	Standardized patients	6 (40.0)
Part task trainer	5 (33.3)		

Faculty shortages

Simulation technicians	14 (93.3)	Researchers	14 (93.3)
Standardized patient trainers	13 (86.7)	Researcher assistants	13 (86.7)
Course directors	10 (66.7)	Officers	10 (66.7)
Educators	10 (66.7)	Instructors	7 (46.7)

Instructor data (N = 154; n (%))

Insufficient faculty	115 (74.4)	Shortage of simulators	107 (69.5)
Insufficient time	97 (63.0)	Insufficient faculty training	91 (59.1)
Insufficient financial support	88 (57.1)	Shortage of space	73 (47.4)

Shortages of technicians in 93.3%, SP trainers in 86.7%,
Screen-based simulation 80%, Faculty 74.4%,

Building A New Simulation Center in Thailand



Ramathibodi Academy of Simulation for Medical Education

RASME

Space 6,050 square meter



Center for Medical Simulation Comprehensive Instructor Course

October 23-27, 2017
Boston, Massachusetts, USA



Design and Planning



FLOOR PLAN



Multipurpose room



CPR Training room



Detoxification space



Virtual ER



Simulation



FL.2

SP Room



Conference room



Lecture room



FL.1

FL.3

Skill lab



Wet lab



Virtual ward



Control room



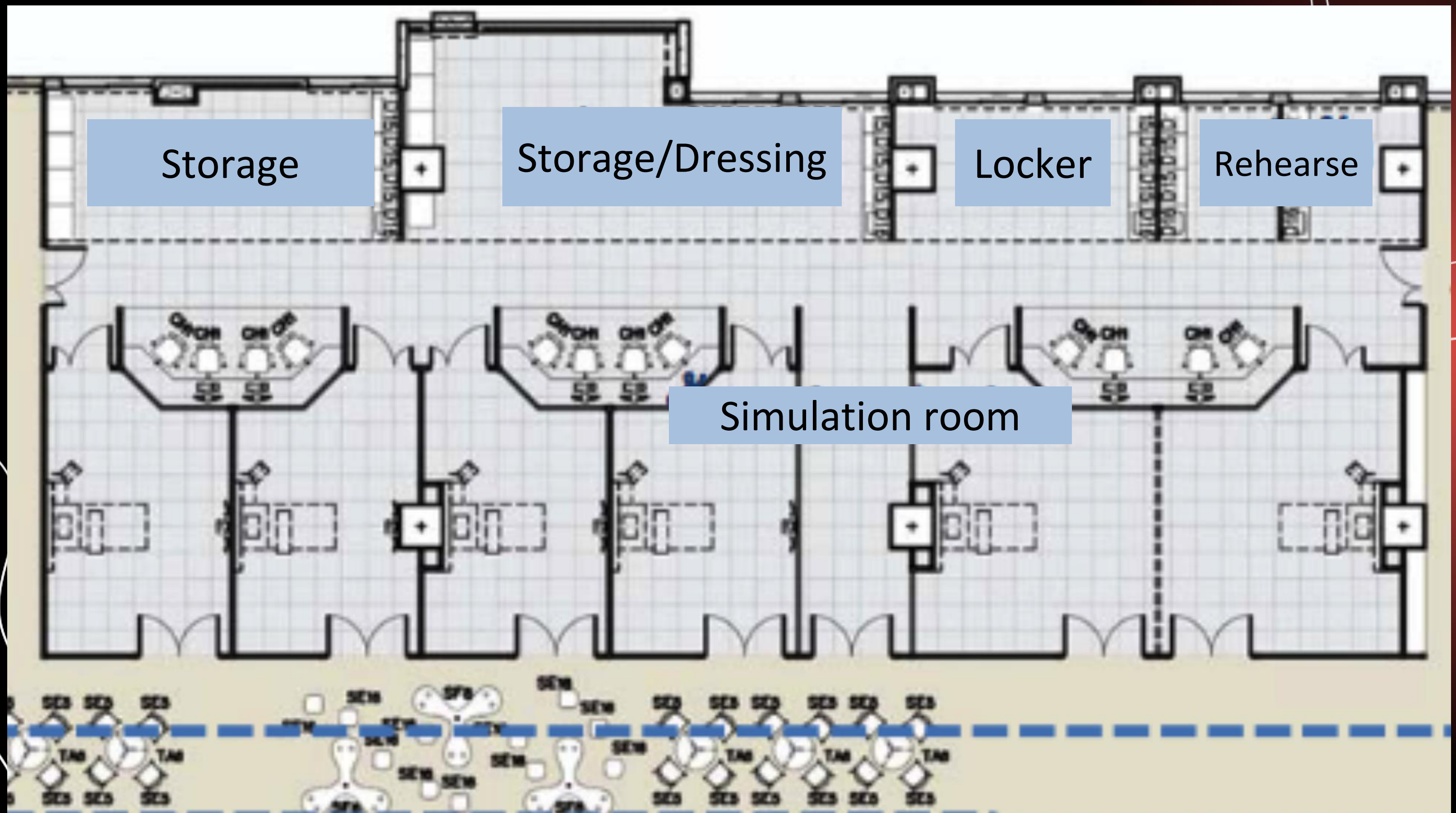
Storage

Storage/Dressing

Locker

Rehearse

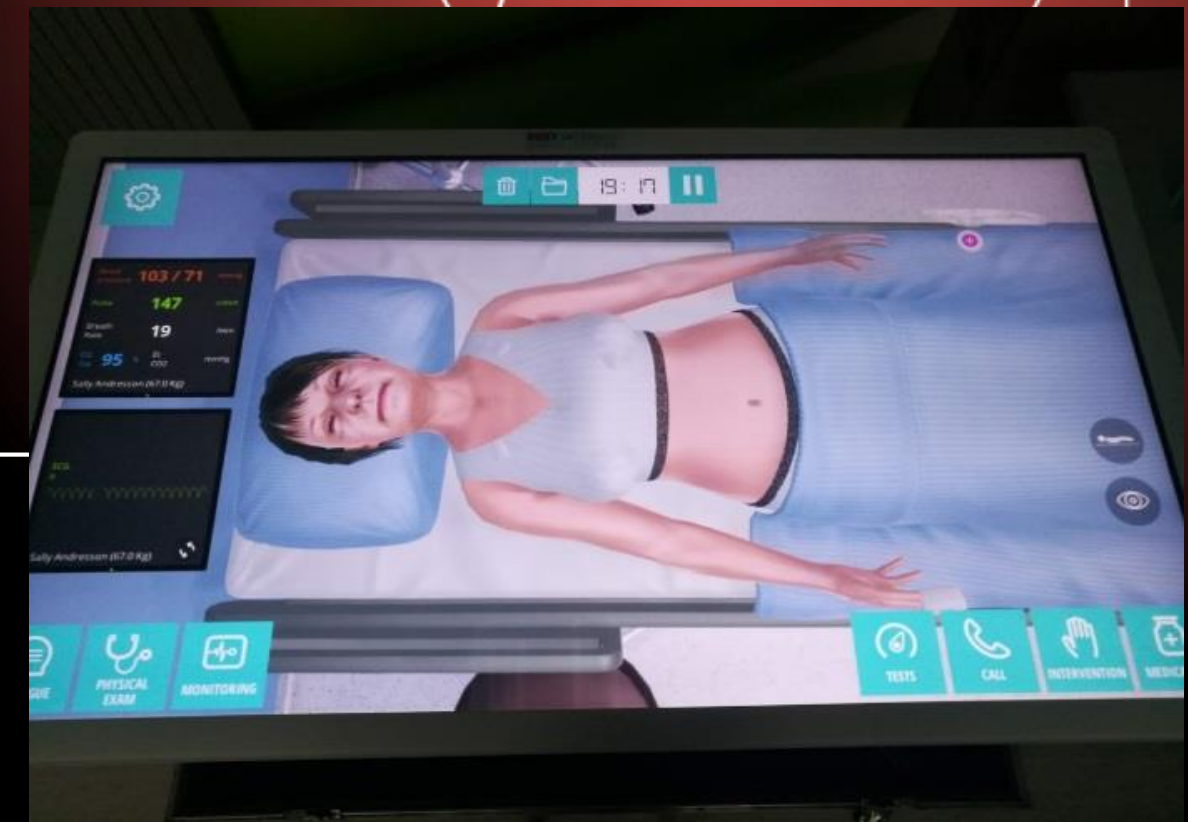
Simulation room



Simulation Technology



Resource from the main campus



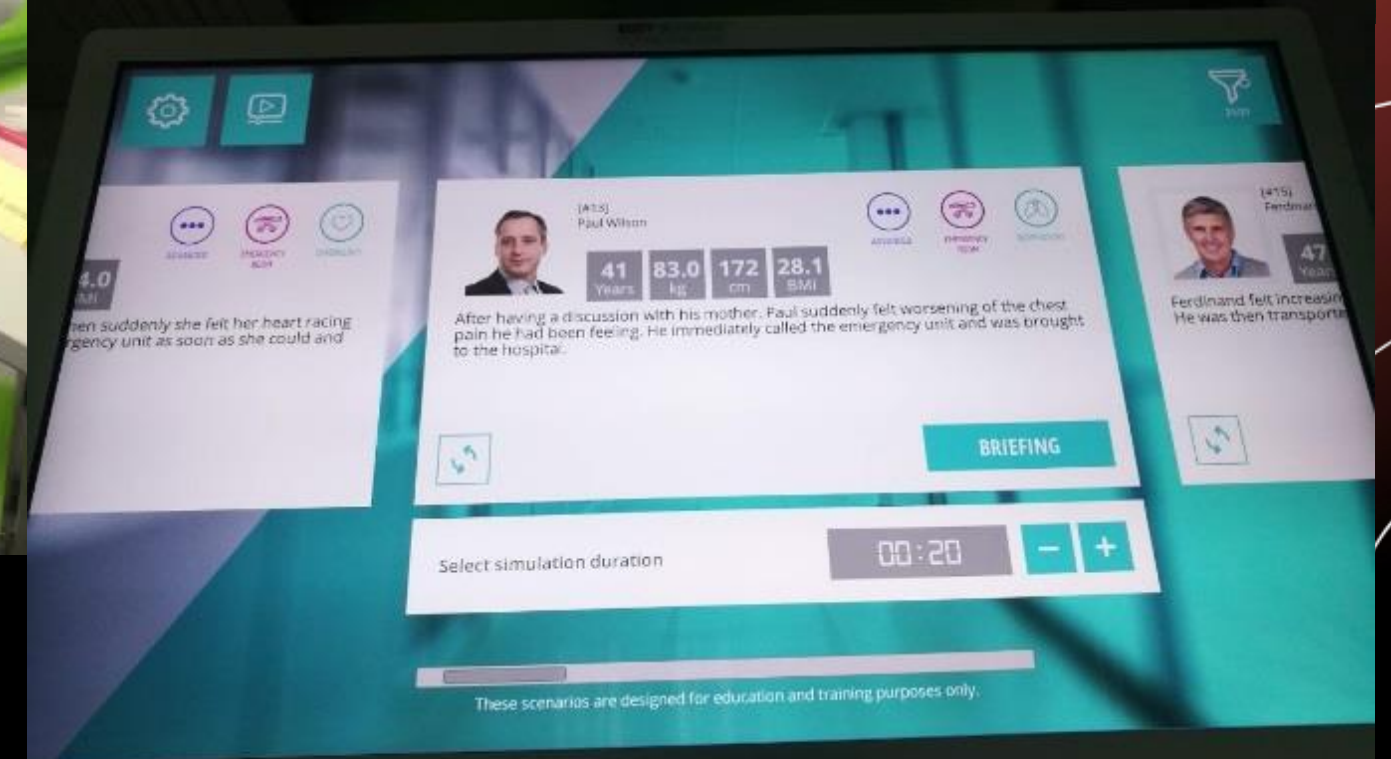
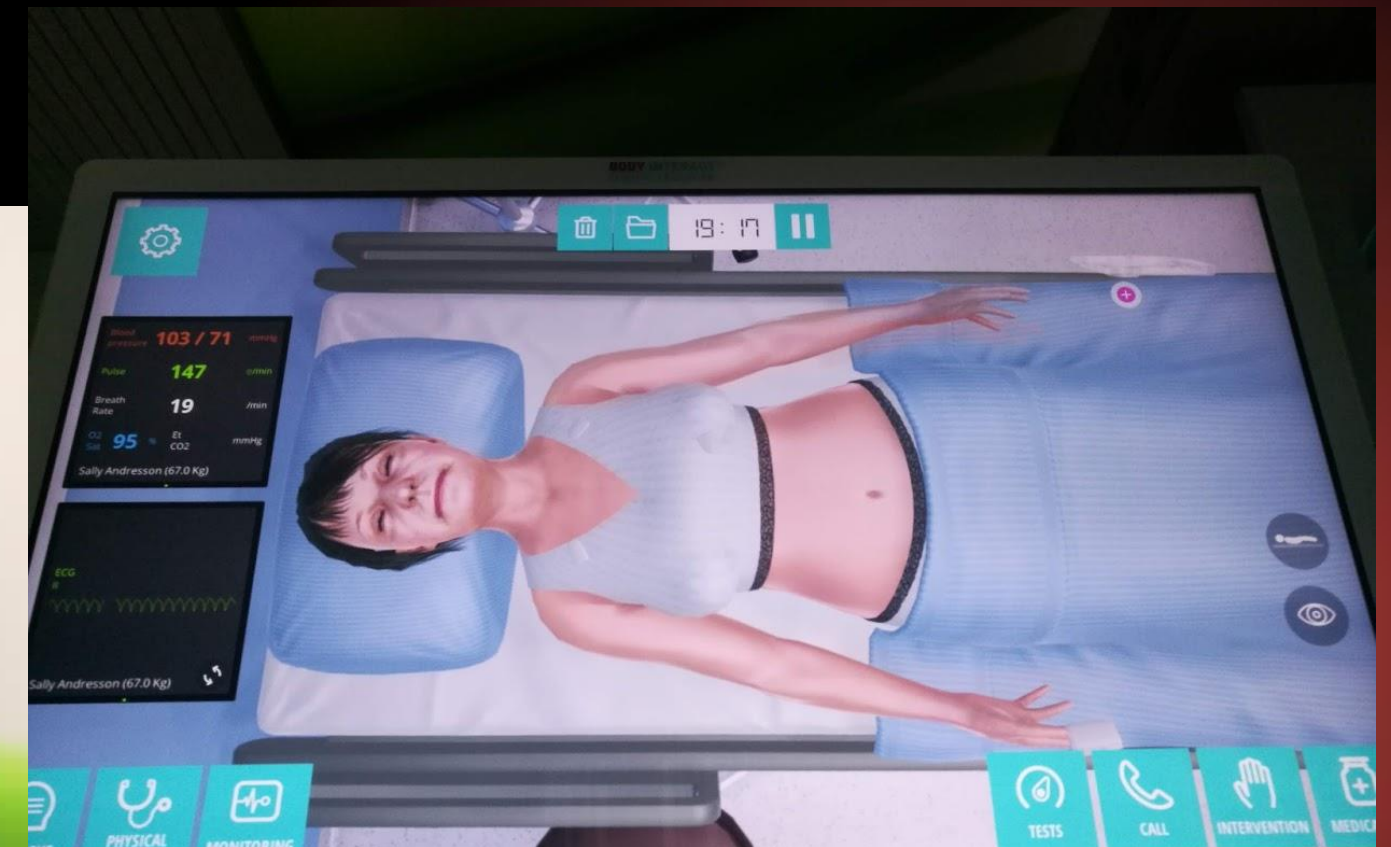
“ Harvey ”

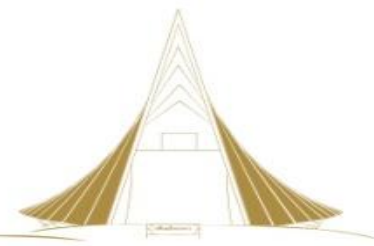
For heart and lung physical examination



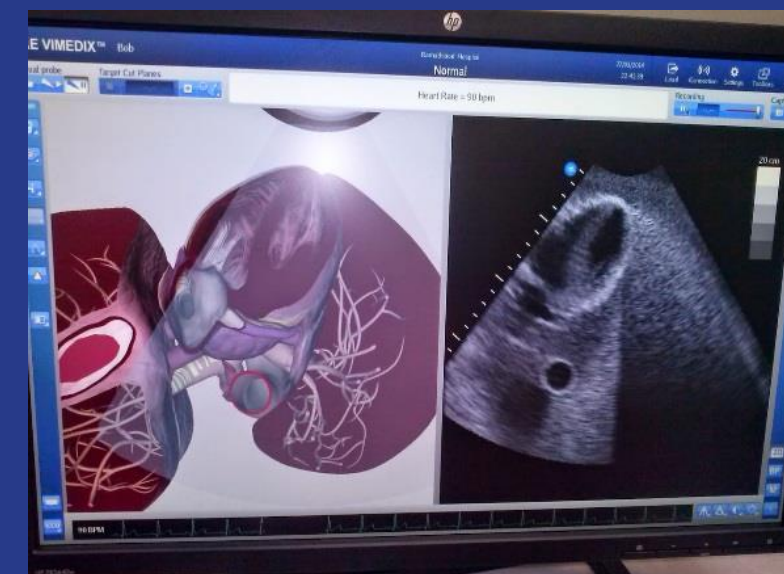
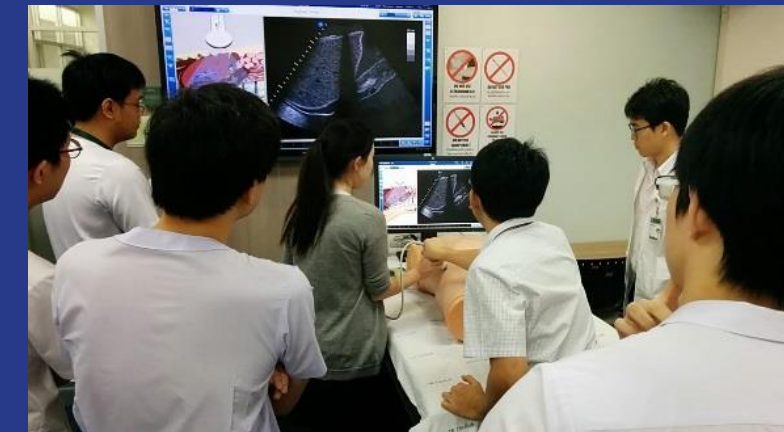
“Body Interact”

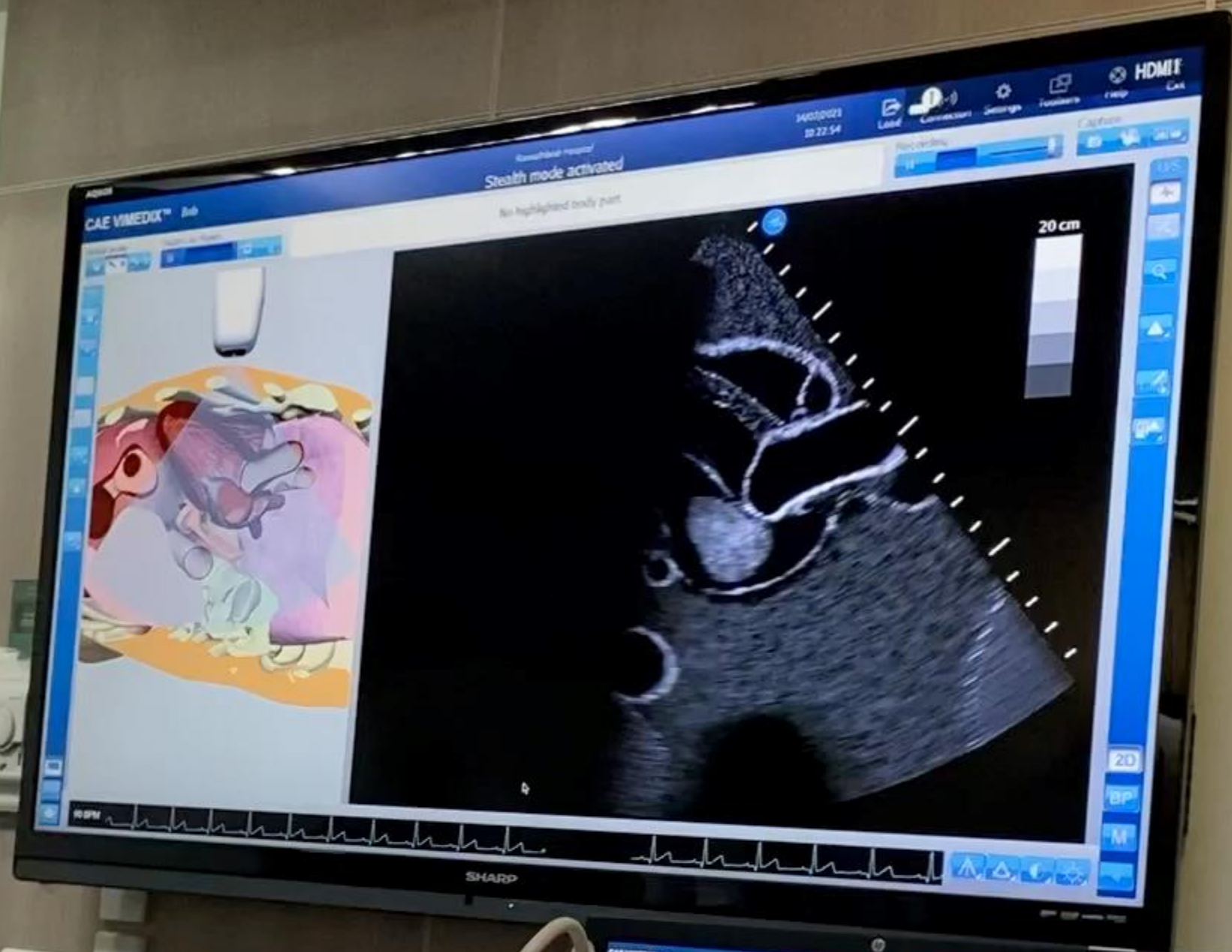
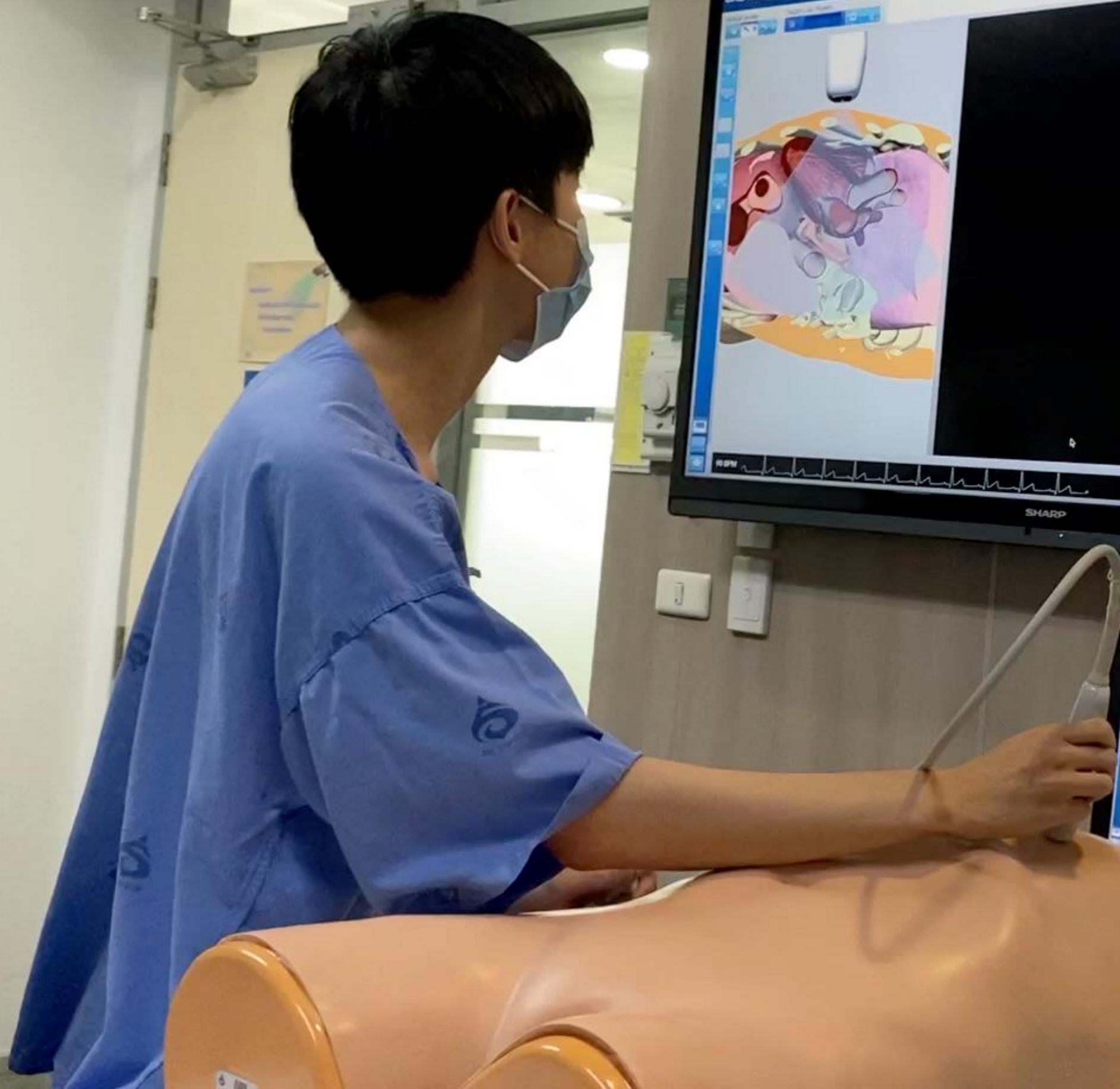
For teaching clinical decision making



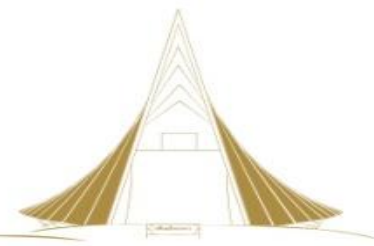


Sim Ultrasound



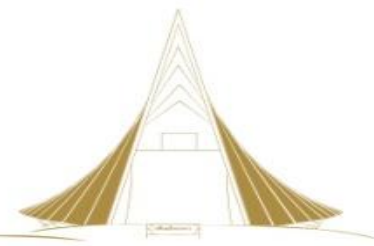






Sim Mom





Ramathibodi Laparoscopic Training Center





Laceration wound



Laceration wound



Abrasion wound



Challenges and Solution



Building a new simulation from scratch is not easy

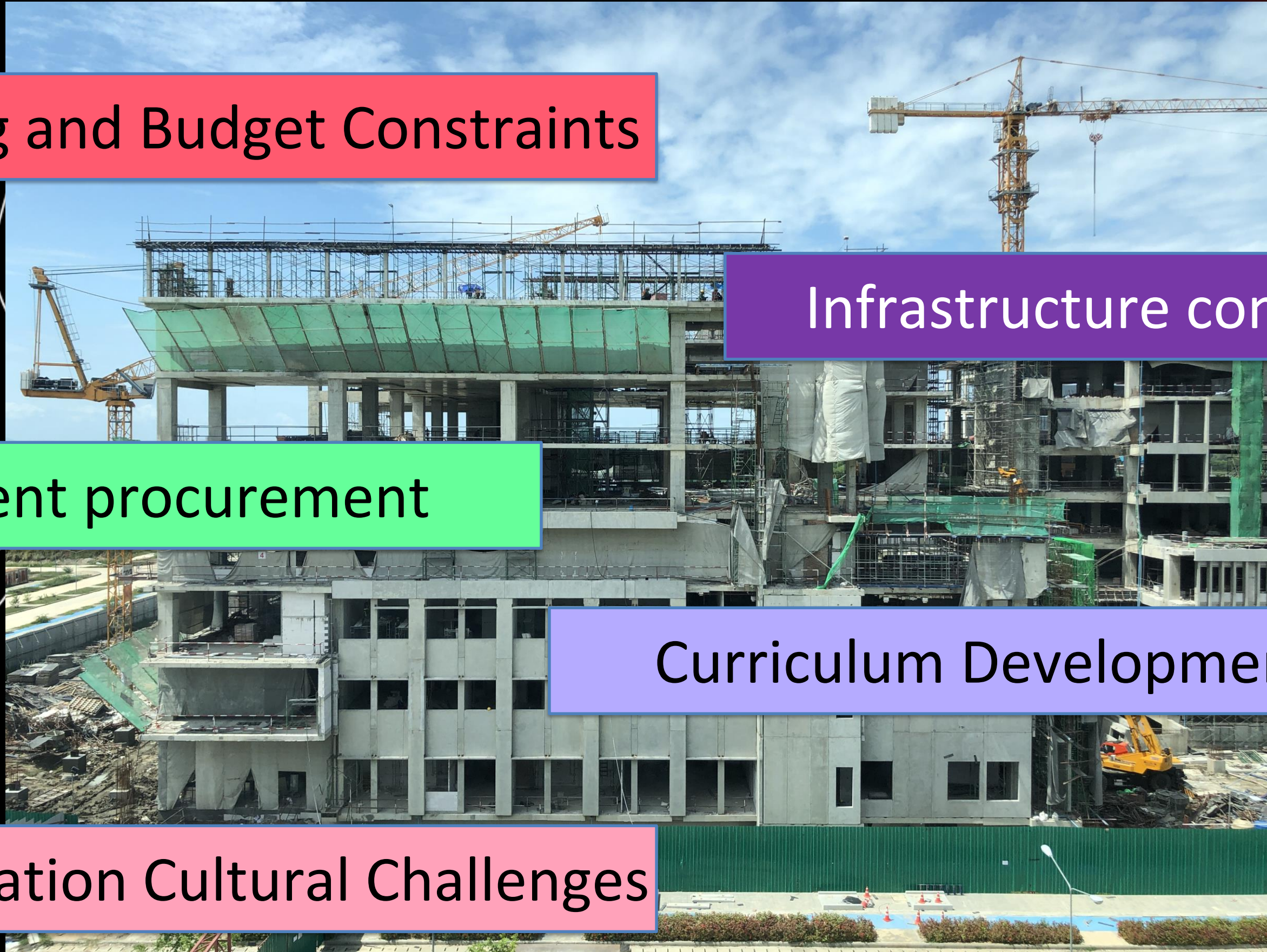
Funding and Budget Constraints

Infrastructure construction

Equipment procurement

Curriculum Development

Organization Cultural Challenges



Curriculum Development



- Clinical skill course for 5th year medical student
- Emergency and Critical care for 5th medical students
- Clinical skill for 6th year medical students

Challenges and Solution

Risk ————— Danger
 险 Opportunity

In Every Risk there is an Opportunity











Mahidol University
Faculty of Medicine
Ramathibodi Hospital

Simulation with virtual patient for undergraduate medical students in the light of COVID-19 pandemic

Yotsawat Suwanlikit, 6th year medical student

Advisor : Asst. Prof. Pongtong Puranitee, MD

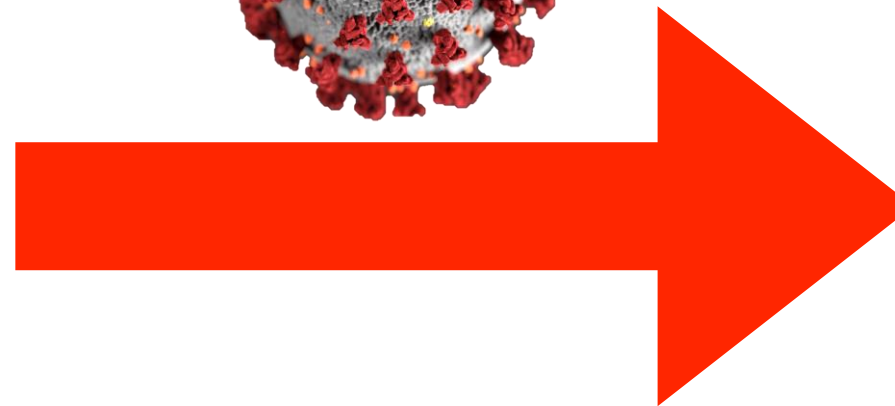
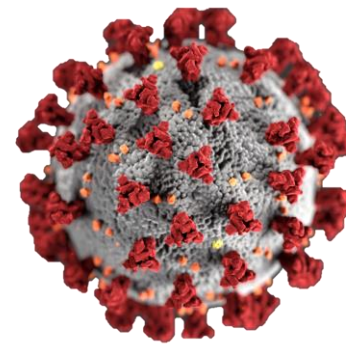
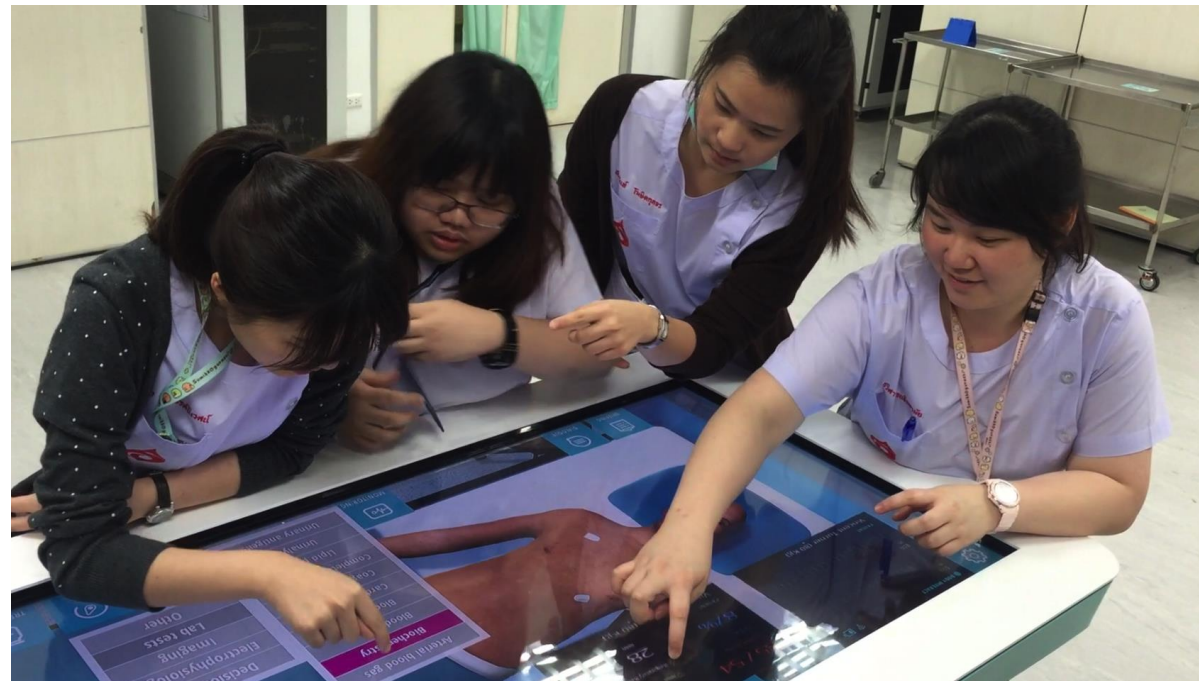
Assoc. Prof. Teerapat Yingchoncharoen, MD

COVID-19 and Impact on medical education

BODY INTERACT™



Face-to-face



Online

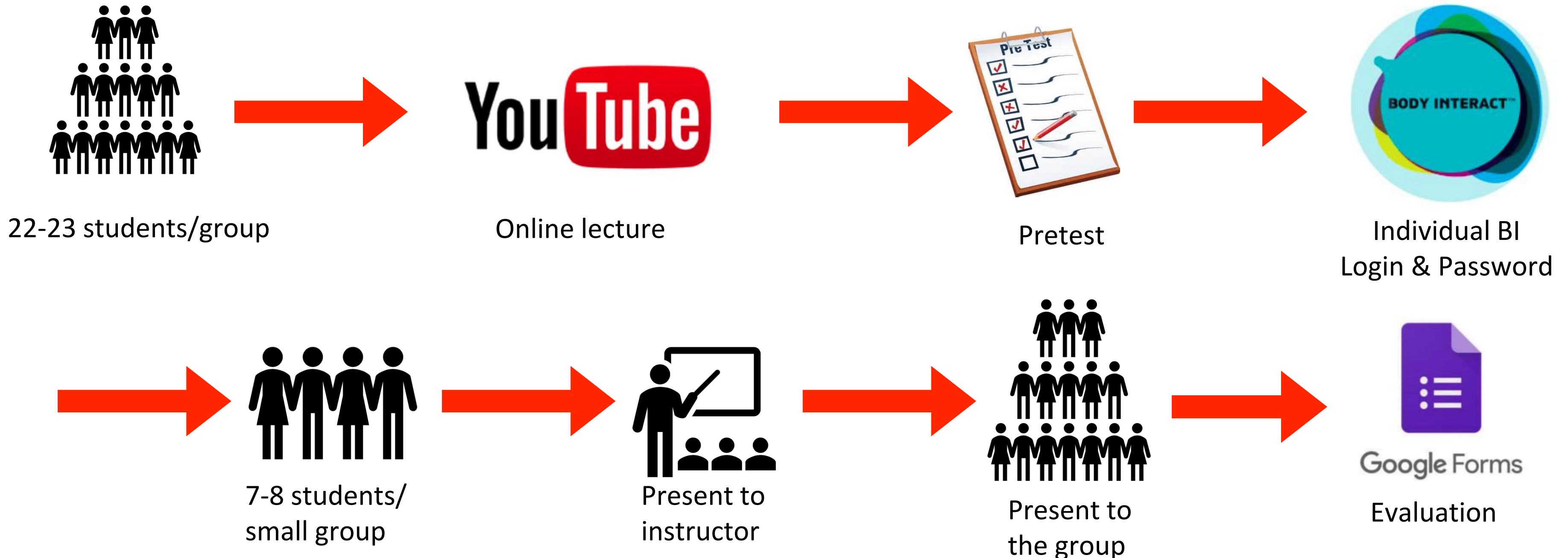


Study population and Methods

BODY INTERACT™



5th year medical students attending heart failure class during IM rotation (N=64)





02:04



Biochemistry



Test

Decision aids

HIV specialist assessment

Seattle heart failure calculator

White blood cell count

			Ref. interval
			4500 - 11000
Neutrophils	3047	/ μ L	1800 - 7800
Lymphocytes	2376	/ μ L	1000 - 4800
Monocytes	785	/ μ L	0 - 800
Eosinophils	28	/ μ L	0 - 450
Basophils	30	/ μ L	0 - 200
Erythrocytes	4.3	$\times 10^6$ / μ L	3.9 - 5.5
Hemoglobin	11.5	g/dL	12.6 - 17.7
Hematocrit	34.6	%	42 - 50
MCV	82.6	μ m ³	80 - 100
MCH	27.9	pg/cell	26 - 34
MCHC	34.9	g/dL	33 - 37
RDW	12.2	%	11.5 - 15
Platelets	240	$\times 10^3$ / μ L	150 - 350



12-Lead ECG

Sinus rhythm.

Blood pressure **98 / 69** mmHg
Pulse **78** /min
Breath Rate **19** /min
O2 Sat **96** %
Et CO2 mmHg
Michel Blanchard (75.0 Kg)

ECG II

Michel Blanchard (75.0 Kg)



DIALOGUE



PHYSICAL EXAM



MONITORING



TESTS



CALL



INTERVENTION



MEDICATION



Whole group presentation

BODY INTERACT™



Whole group presentation

BODY INTERACT™

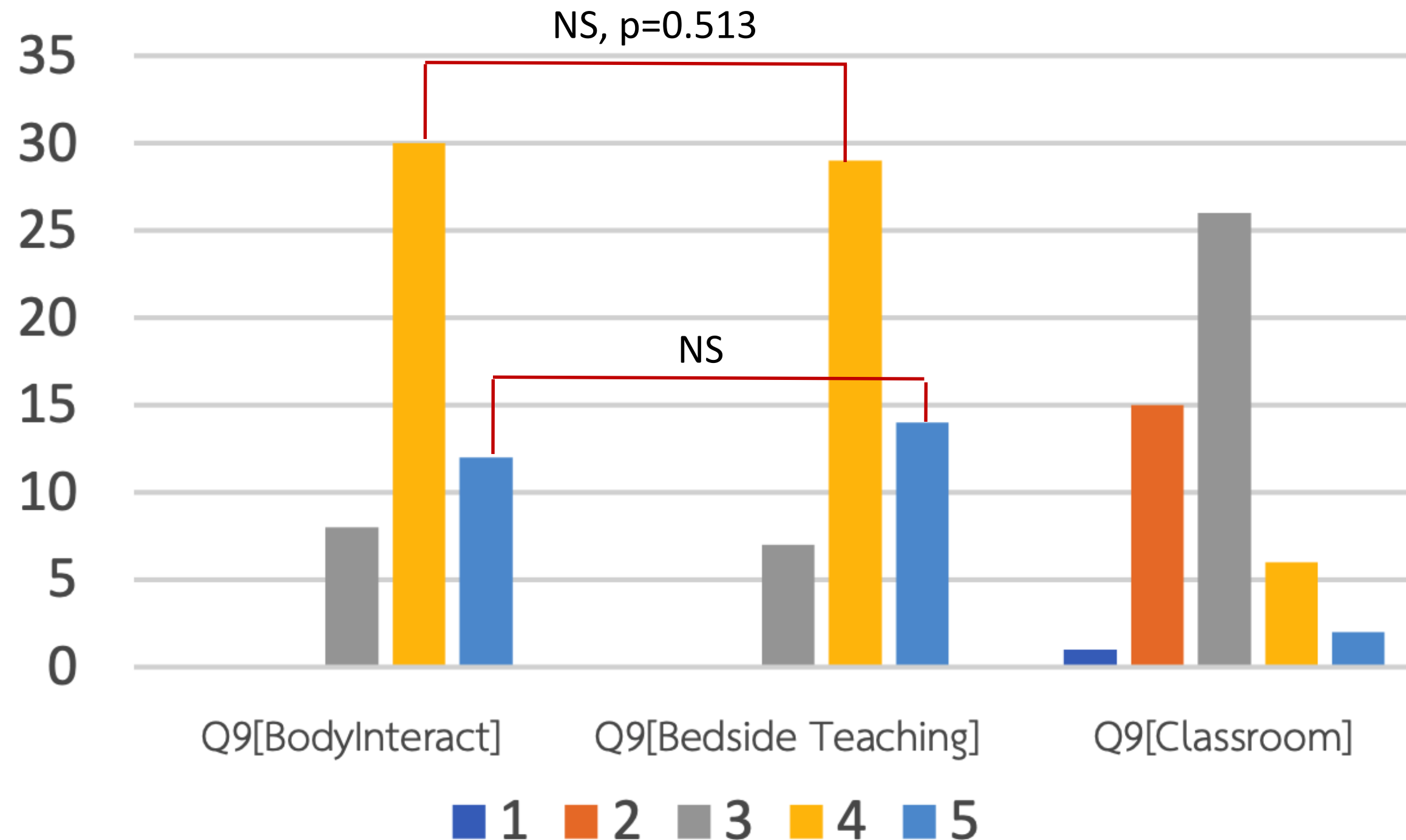


The screenshot displays the BODY INTERACT virtual patient simulation interface. The central focus is a male patient, William Nielsen (87.0 Kg), lying on a hospital bed. The interface includes several key components:

- Top Bar:** Contains icons for settings (gear), delete (trash), folder, a clock showing 18:44, and a pause button.
- Left Panel:** Displays vital signs and patient information:
 - Blood pressure: 163 / 94 mmHg
 - Pulse: 131 /min
 - Breath Rate: 32 /min
 - O2 Sat: 90 %
 - Et CO2: mmHg
 - Patient Name: William Nielsen (87.0 Kg)
- ECG Panel:** Shows a 12-lead ECG trace for Lead II, with the patient name William Nielsen (87.0 Kg) at the bottom.
- Dialogue Box:** A central pop-up window titled "Dialogues" with the sub-header "Risk factors". It contains three questions:
 - Do you have high blood pressure?
 - Do you have high cholesterol?
 - Do you smoke?
- Right Panel:** Features a vertical stack of five small video feeds showing different views of the patient and the simulation environment.
- Bottom Bar:** Includes a row of icons for "DIALOGUE", "PHYSICAL EXAM", and "MONITORING". Below this is a row of four larger icons for "TESTS", "CALL", "INTERVENTION", and "MEDICATION".

Results

Perception of knowledge gain from different teaching methods



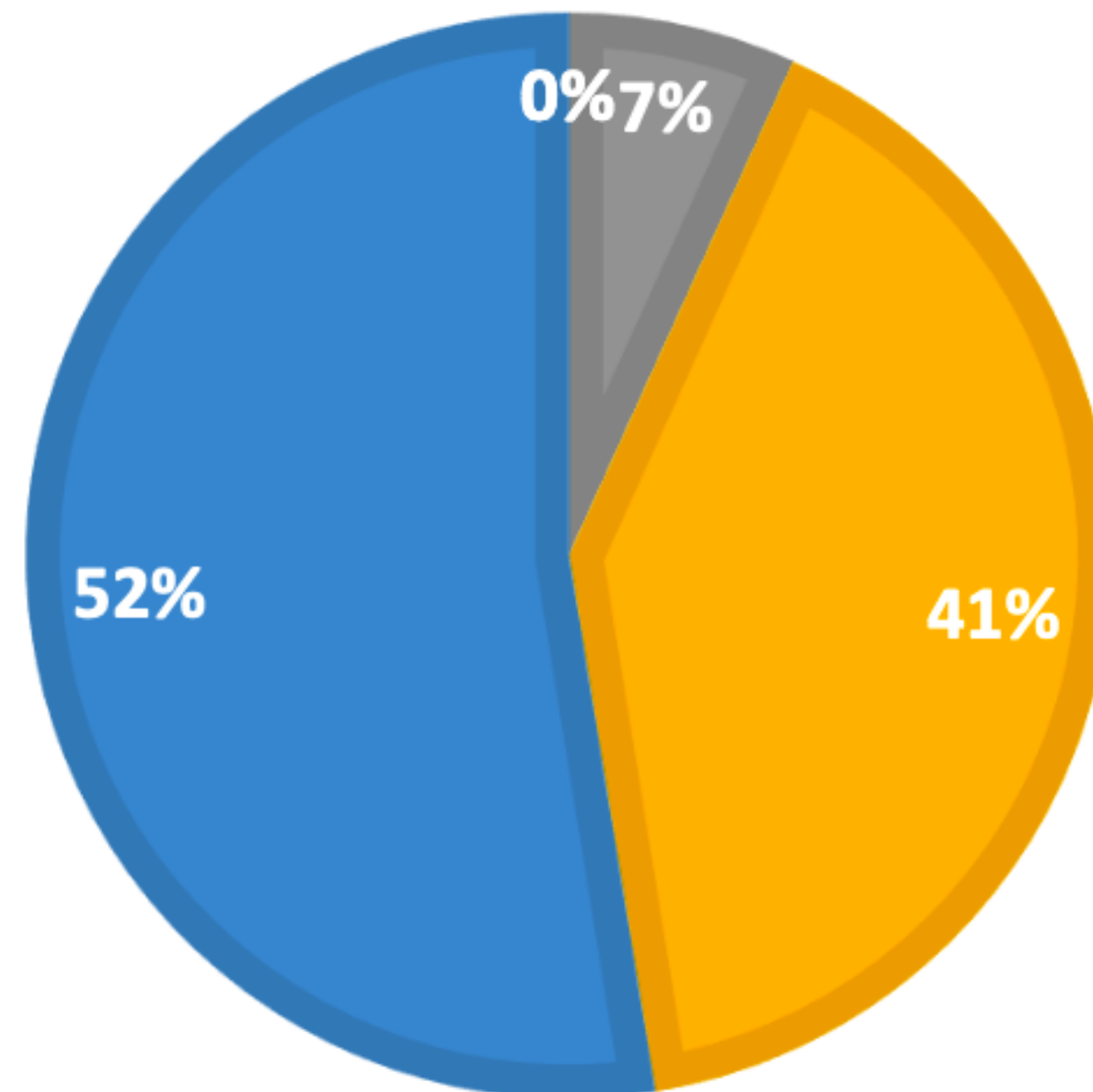
Results

BODY INTERACT™



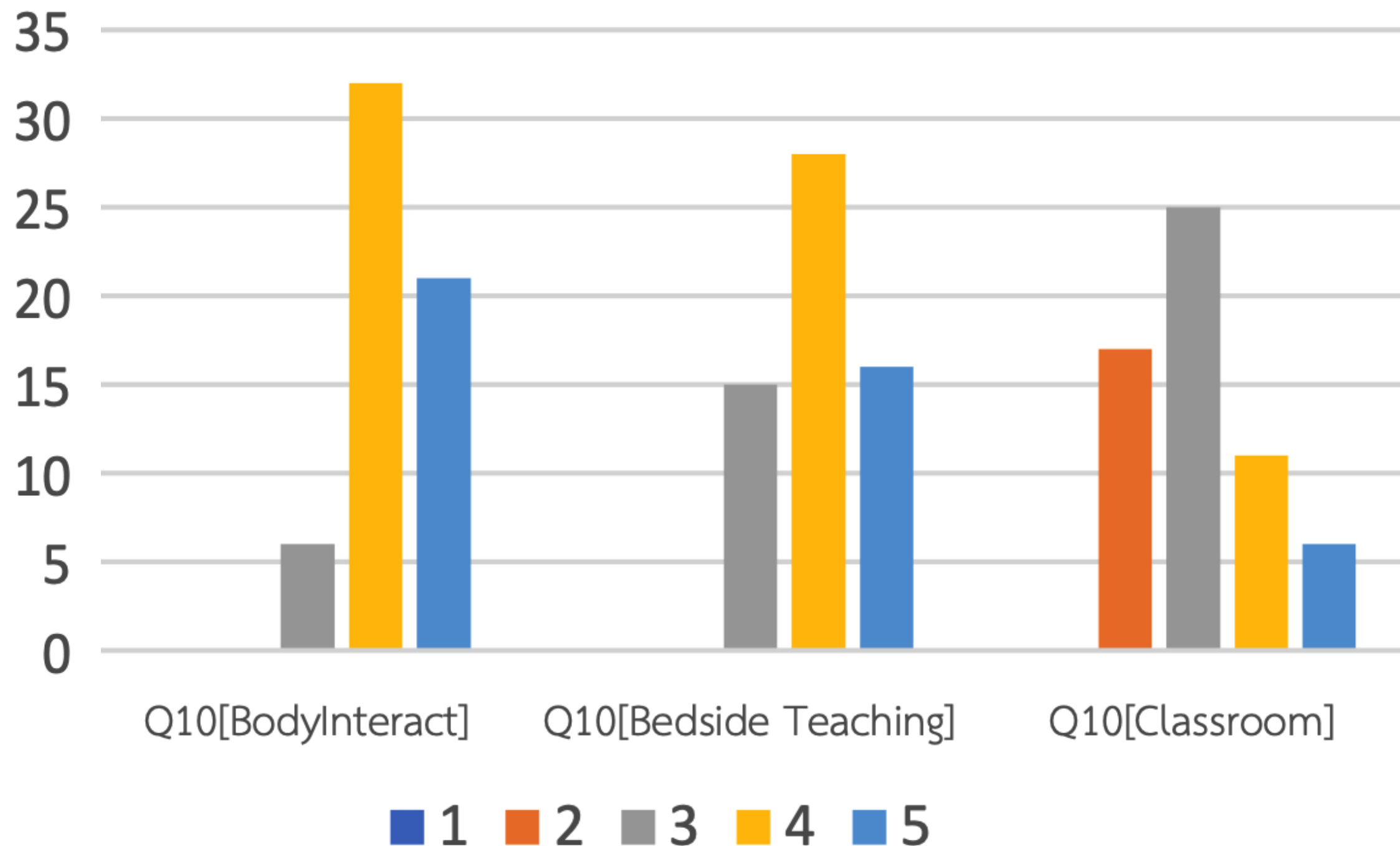
“How much do you satisfied the online training session with BodyInteract”

■ very unsatisfied ■ rather unsatisfied ■ neutral ■ rather satisfied ■ very satisfied



Results

Preference of different teaching methods



Result: Educational impact

BODY INTERACT™



Engaged students.

‘I feel very excited when I hear the patient’s heart rate.’

More authentic.

‘The patient could have new different problems compared to previous plays based on types and times of drugs being used.’

Practice time management as well as priority setting.

‘Some virtual-patient simulation scenario has different medical problems and conditions that needed to prioritize management. If my decision on prioritized management and timing was wrong, these would affect patient outcome.’

Stimulate feedback, self-assessment and reflection.

‘When I played, I knew exactly which part of knowledge content that I must study more before move on.’

Success Story

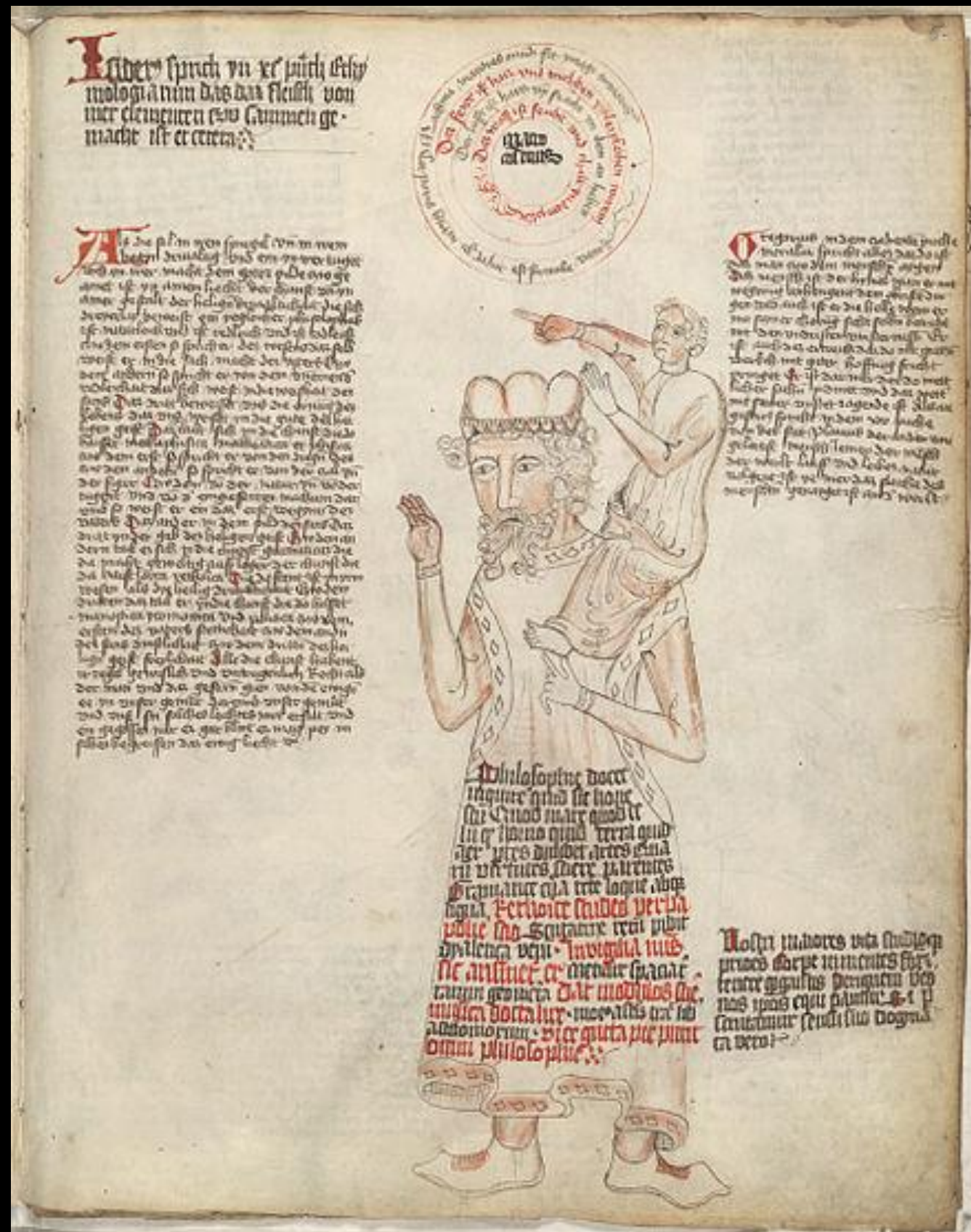


SIMULATION CENTER



Acknowledgment

- Deans and Ex-Deans
- Administrators
- Faculties
- Students
- Officers
- Everyone who had helped



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