Transforming Constraints into Opportunities: Re-envisioning Medical Education

Implementing a Flipped- Classroom Approach

Peter Horneffer, MD
Executive Dean
All American Institute for Medical Sciences, JM

Director
Medical Education Programs
Lecturio.com

Cardiac Surgeon, Sinai Hospital
Baltimore, Maryland

Rajuno Ettarh, MD, PhD
Associate Dean
Pre-Clerkship Curriculum and Assessments

Professor Anatomy and Medical Education

California University of Science and Medicine, Colton

Disclosures

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A Global Community – We're in this together.

- 112 Medical School Deans and Rectors
- 329 Faculty Members
- 71 Directors / CEOs
- 36 Instructional Designers & Curriculum Experts
- 6 Faculty Development Experts
- 14 Education Consultants
- 29 Students
- 96 "Other"

Epidemics, Pandemics lead to Reform

- Cholera – Improved sanitation and spurred vaccine development
- 1918-1919 Influenza epidemic (Spanish Flu) highlighted economic disparities. Led to improved housing and healthcare.

COVID 19
What will be its Silver Lining?

Emergency Remote Teaching

↓

Effective Evidence-Based Education

Emergency Remote Teaching Model

Same traditional teaching model implemented online

2020

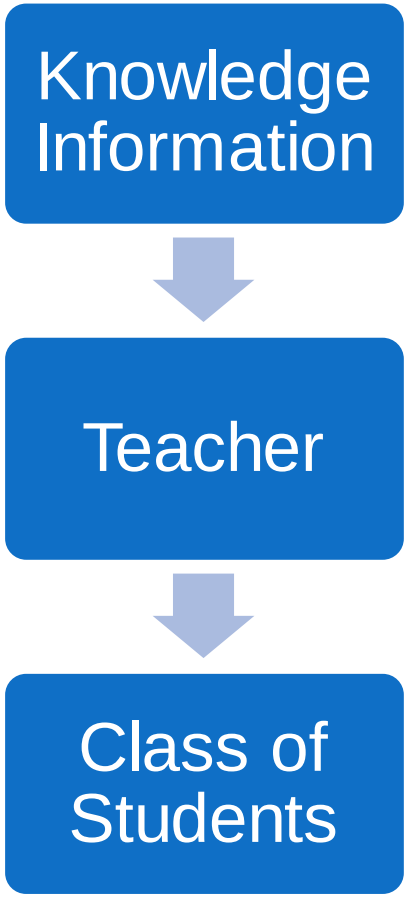
Transforming the Current Reality

One Framework: Evidenced-Based Medical Education

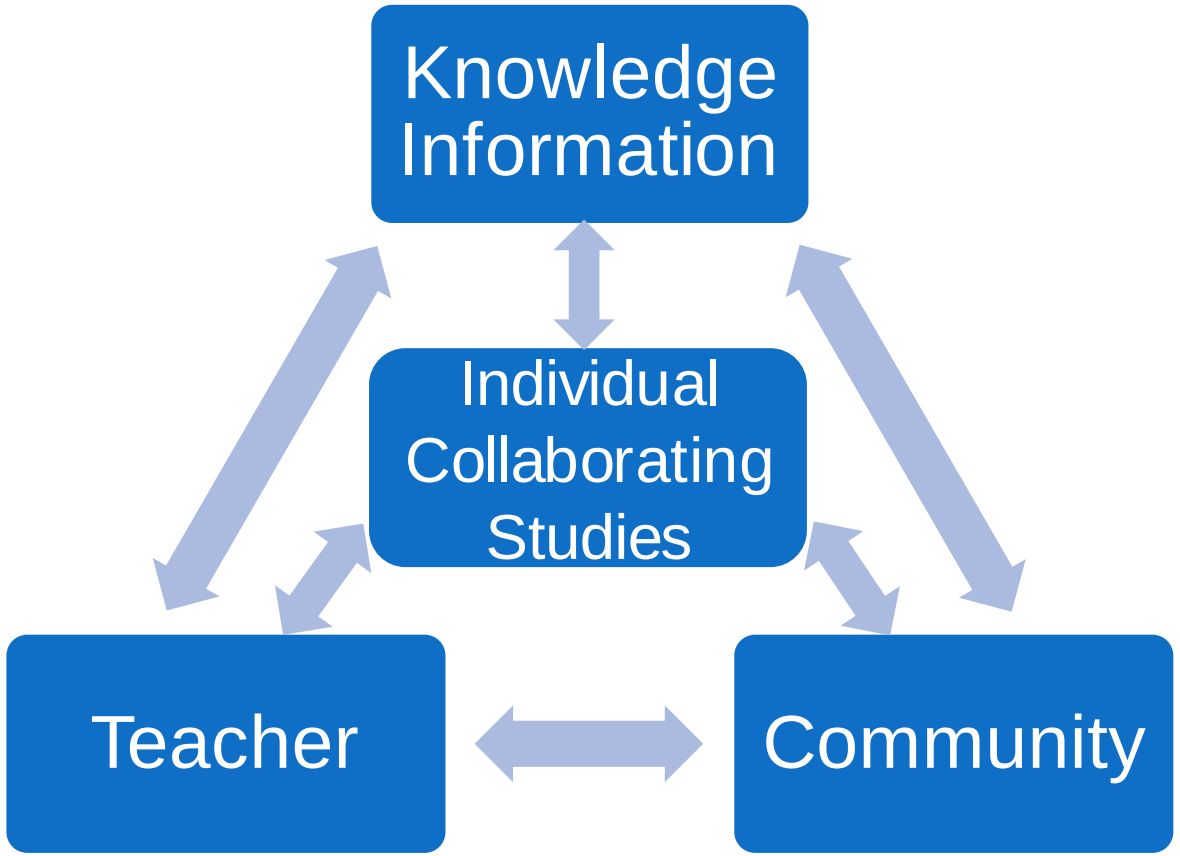
Table 1. Comparing the practice of Evidence-Based Medicine (EBM) and Evidence-Based Medical Education (EBME)

EBM	EBME
1. Articulate Patient's Needs	1. Articulate Curricular Needs
2. Ask Questions	2. Ask Questions
3. Acquire & Appraise Evidence	3. Acquire & Appraise Evidence
4. Apply Evidence	4. Apply Evidence
5. Assess Impact	5. Assess Impact

Active Student-Centered Learning

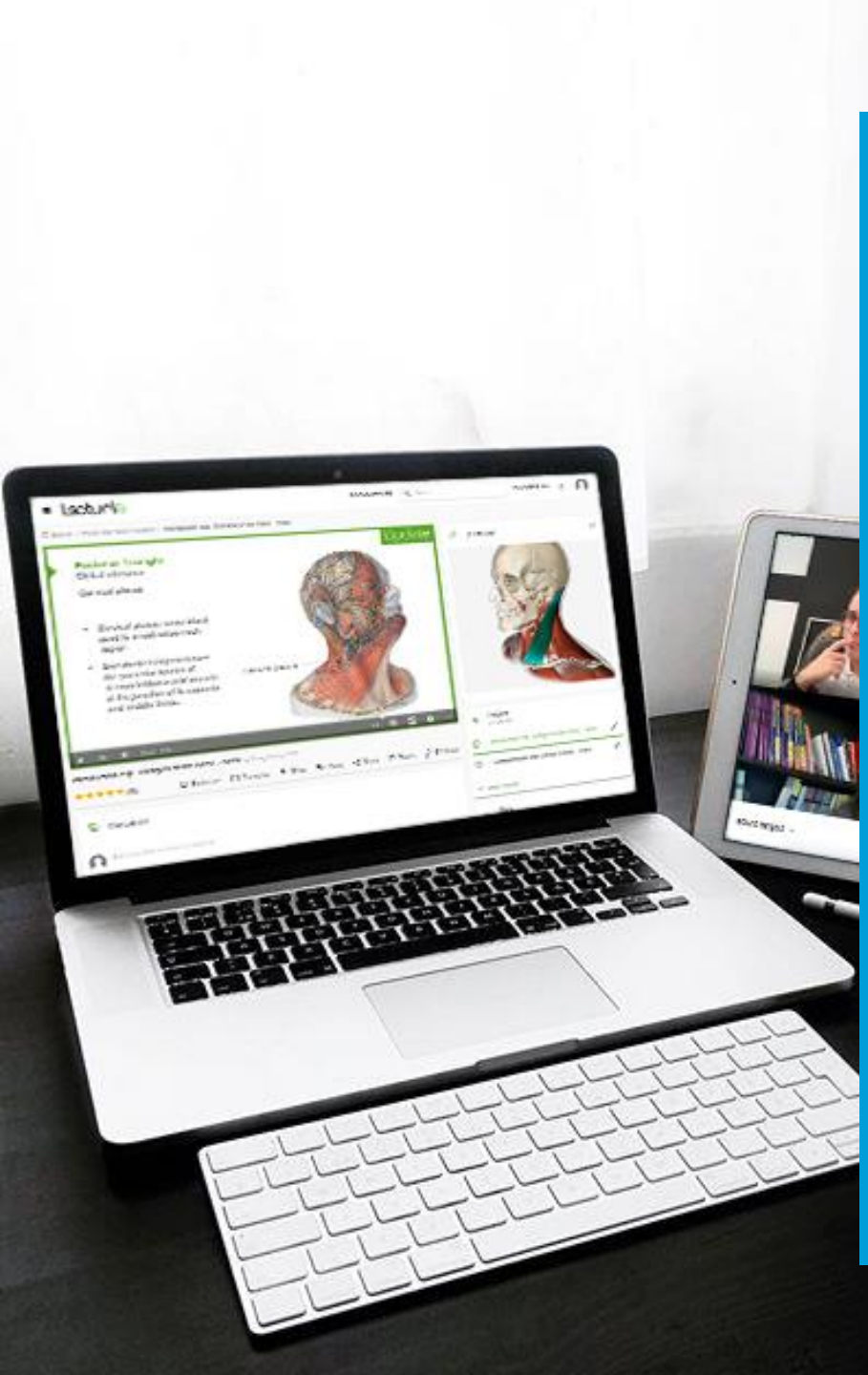


Teacher-Directed Learning



Student-Centered Learning

(Hirumi, 2002)



Transformation of the Educational Process

Platform-based learning: The new gold standard

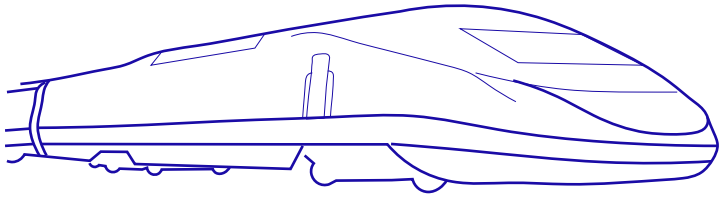
- Flipped classroom - apply evidence-based learning strategies- no live lectures!
- Move from passive to interactive learning- game learning- experiential learning
- Teachers as coaches, mentors, and motivators; creators of content
- Person-to-person interaction augmented, not diminished
- Cost effectiveness in education (Reusing Learning Objects)

How do we flip courses, facilitate active, student-centered learning and meet the needs of 21st century?

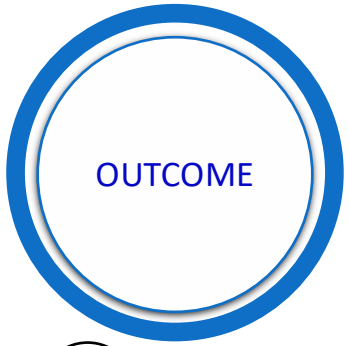
Flipped Classroom at CUSM:

How did CUSM implement FC in the curriculum?

1 Establish program goals



3 Platforms used (Canvas, Lecturio, Panopto)

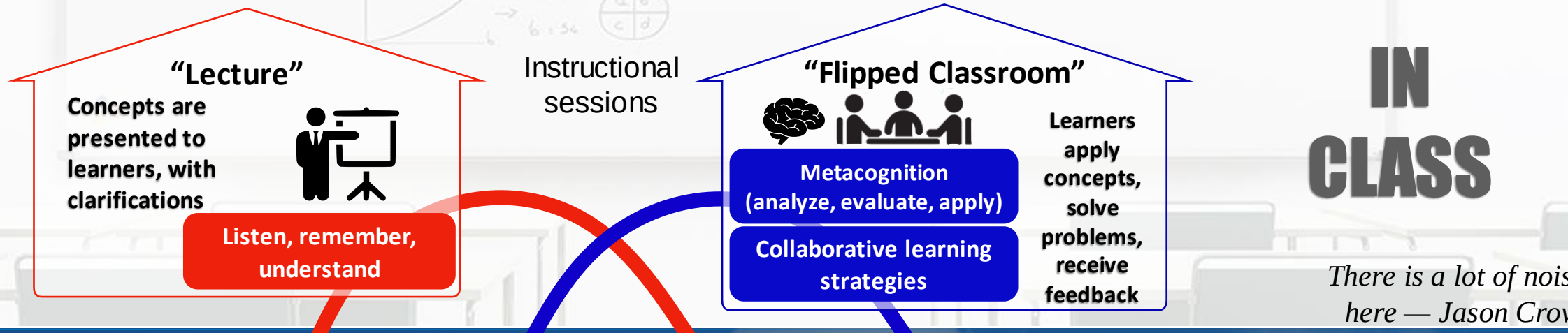


4 Assessment

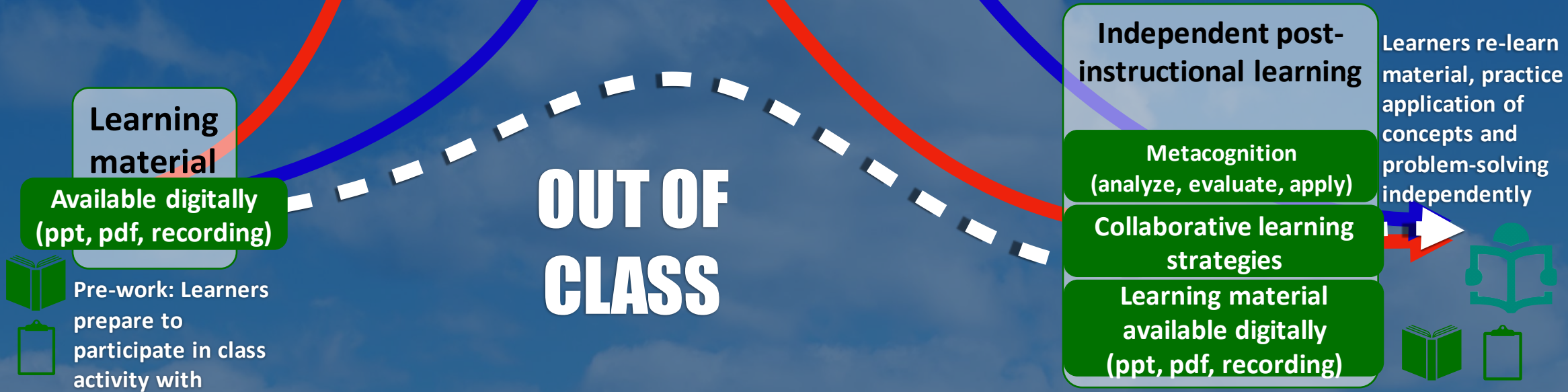
2 Define curriculum delivery strategy

- Flipped classroom with recorded learning material (for pre-work)
- Integrated system-based courses linked to case presentation
- Learning communities / small group

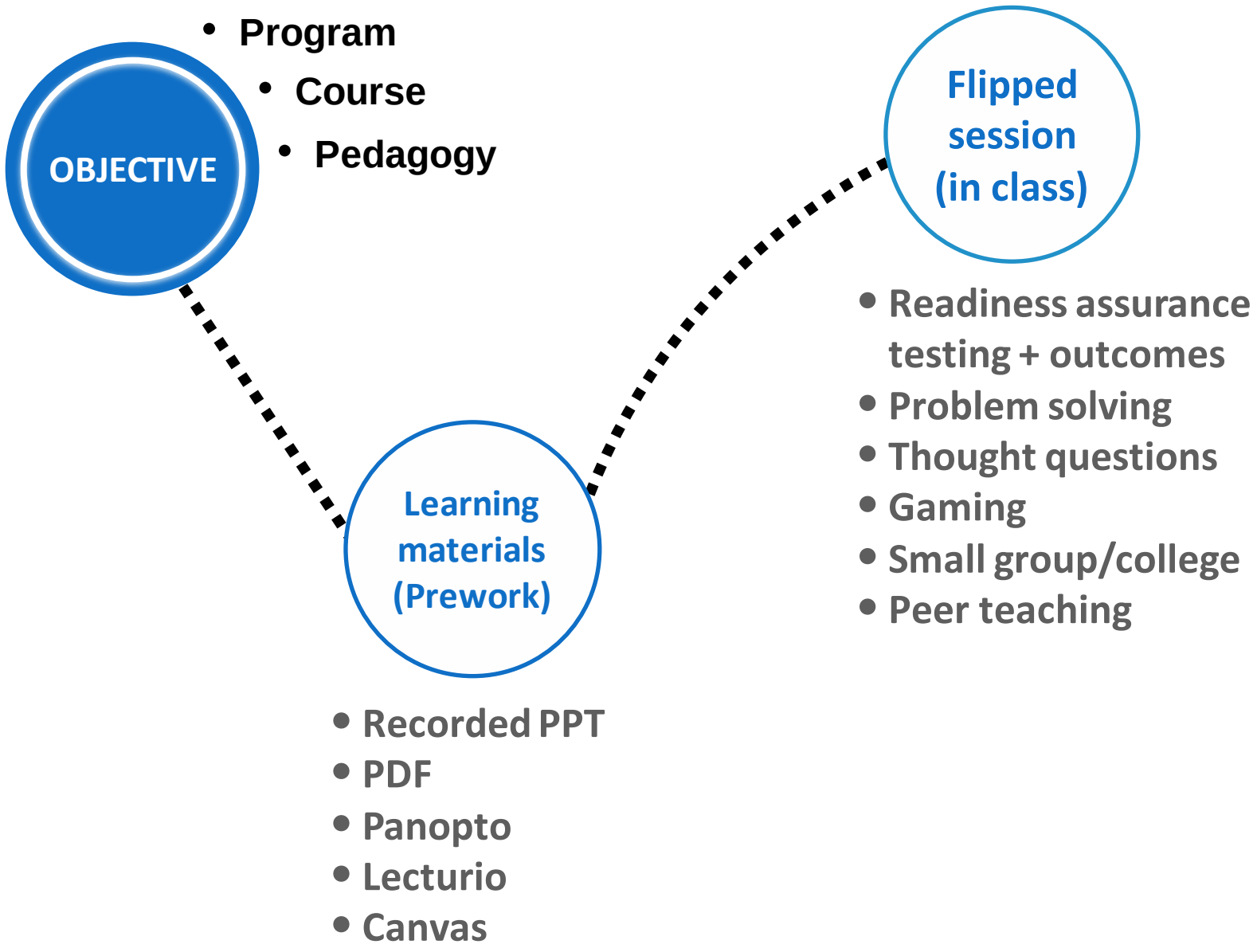
Defining objectives & outcomes for "flipping" the classroom



There is a lot of noise in here — Jason Crowley



Flipped Classroom at CUSM

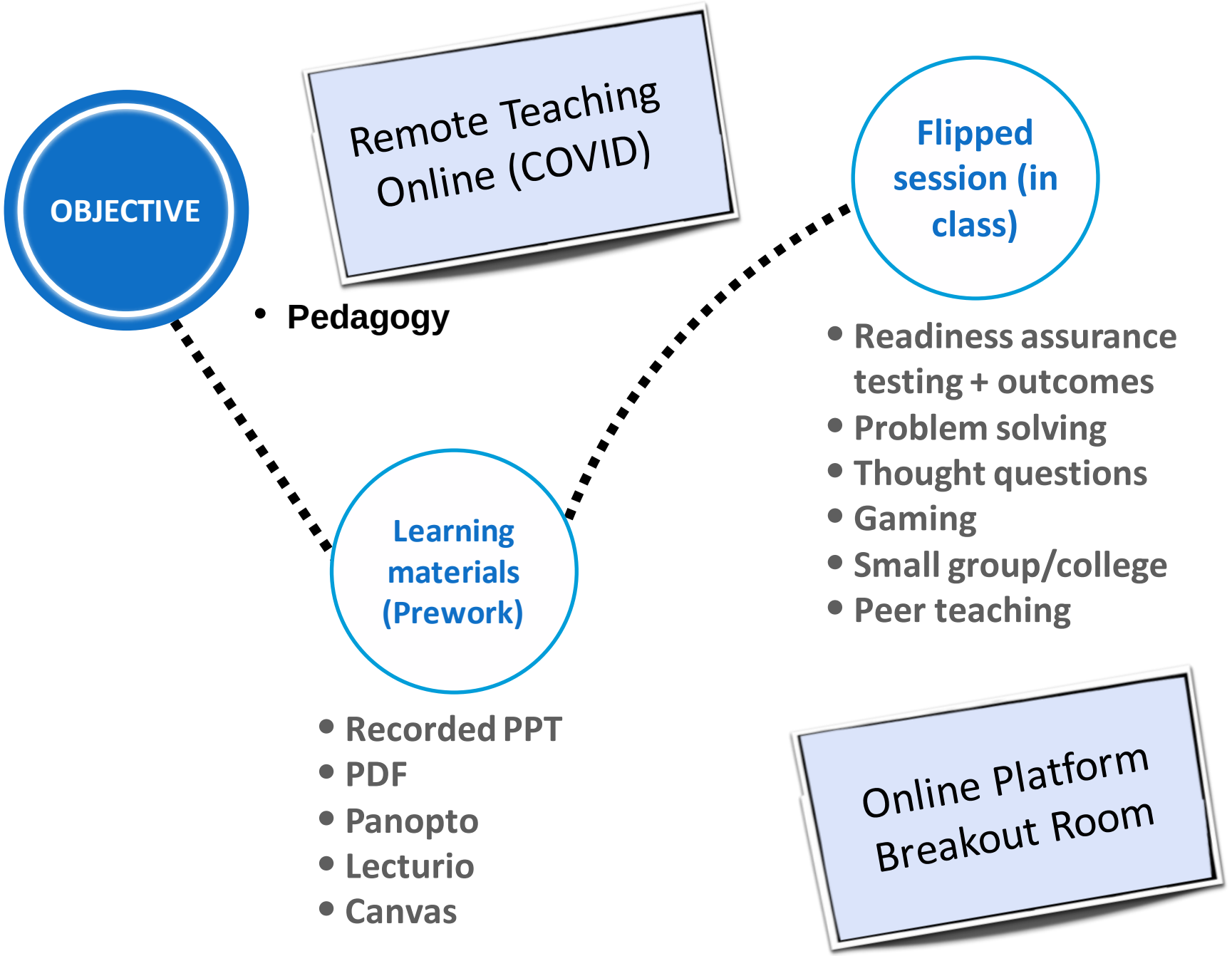


Case Presentation
- Weekly
- Small group
- Structured

Labs
- Problem solving
- Small group

OUTCOME
- RATs / NBME / MCQ
- Practical
- Evaluations
- Professionalism
- USMLE

Flipped Classroom at CUSM



7 Simple Tips for Instruction in an Online Virtual Classroom

- **Objectives**- establish clear learning objectives
- **Engagement**- more learner typewriting, more "live" scribbling by instructor
- **Duration**- think phone-in radio program, avoid hour-long presentations
- **Feedback**- usual visual, verbal, audience feedback is absent
- **Parallel Environment**- "public" side conversation, use teaching assistance if possible
- **Assessment**- think 2-factor authentication, 2 device per examinee
- **Understand Your Platform**- instructions start video/window sharing, learners' default to chat

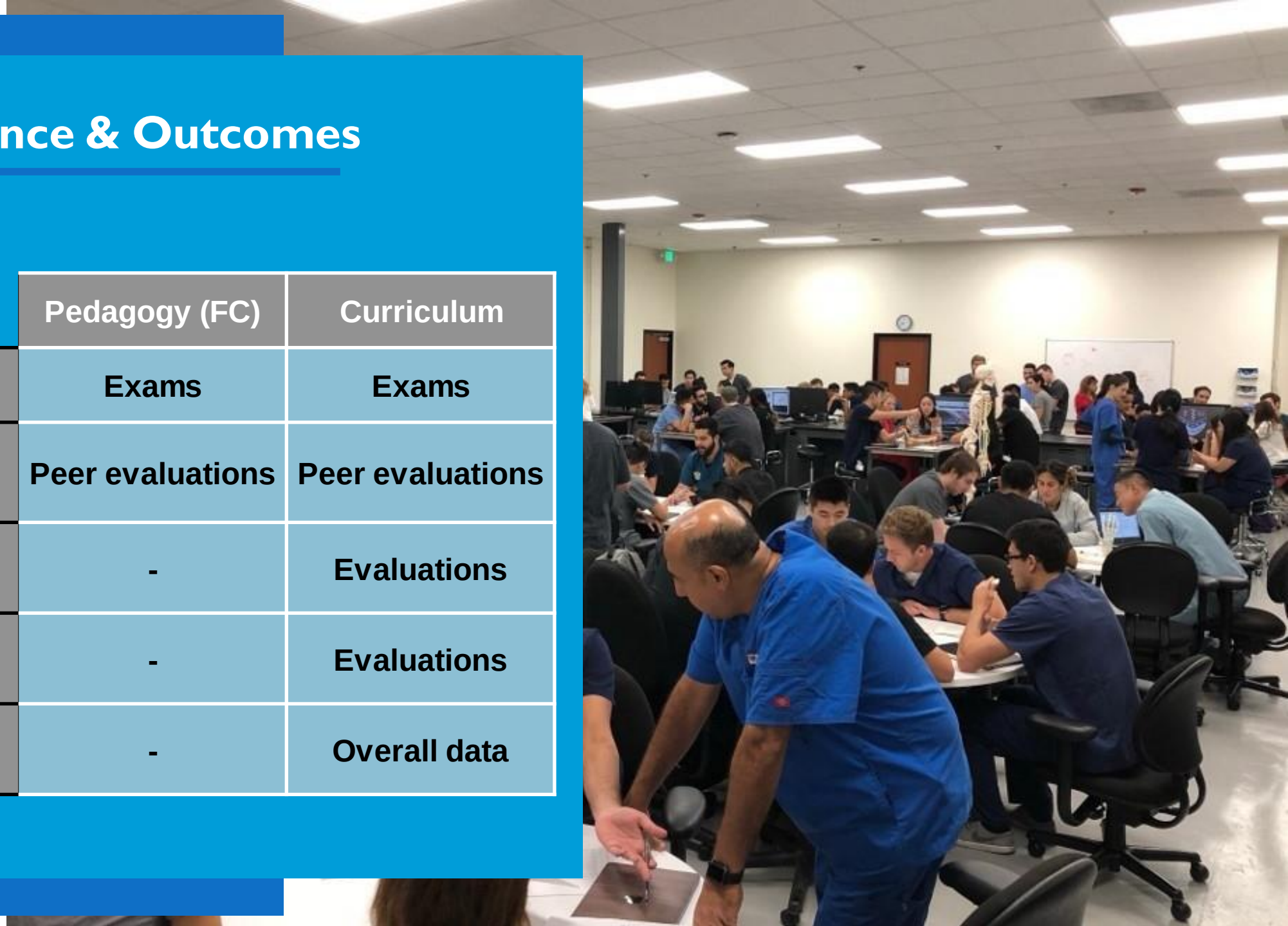
Believe

Students, faculty and staff need to know and be able to see the goal

Council on Foreign Relations website — cfr.org

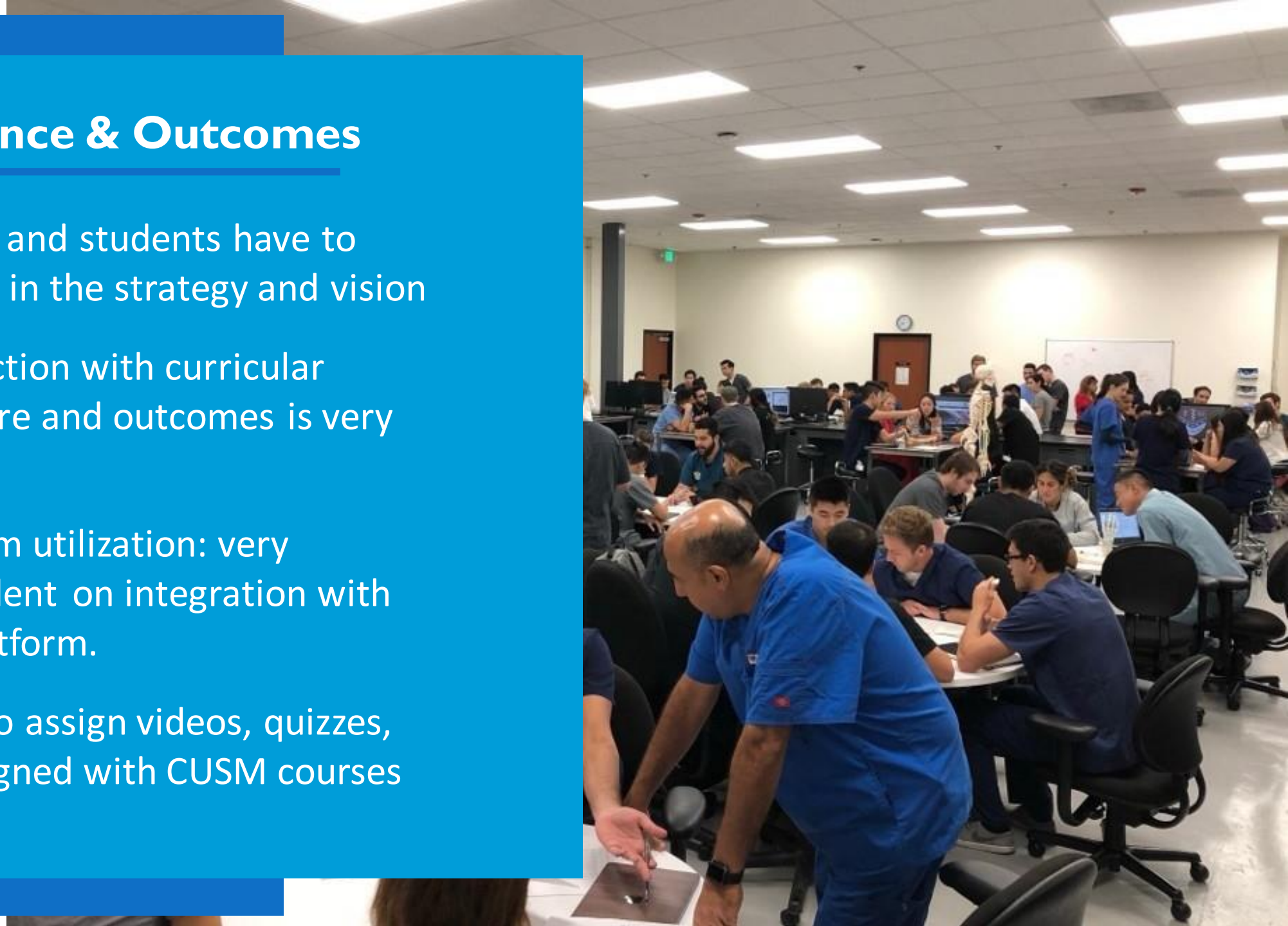
Performance & Outcomes

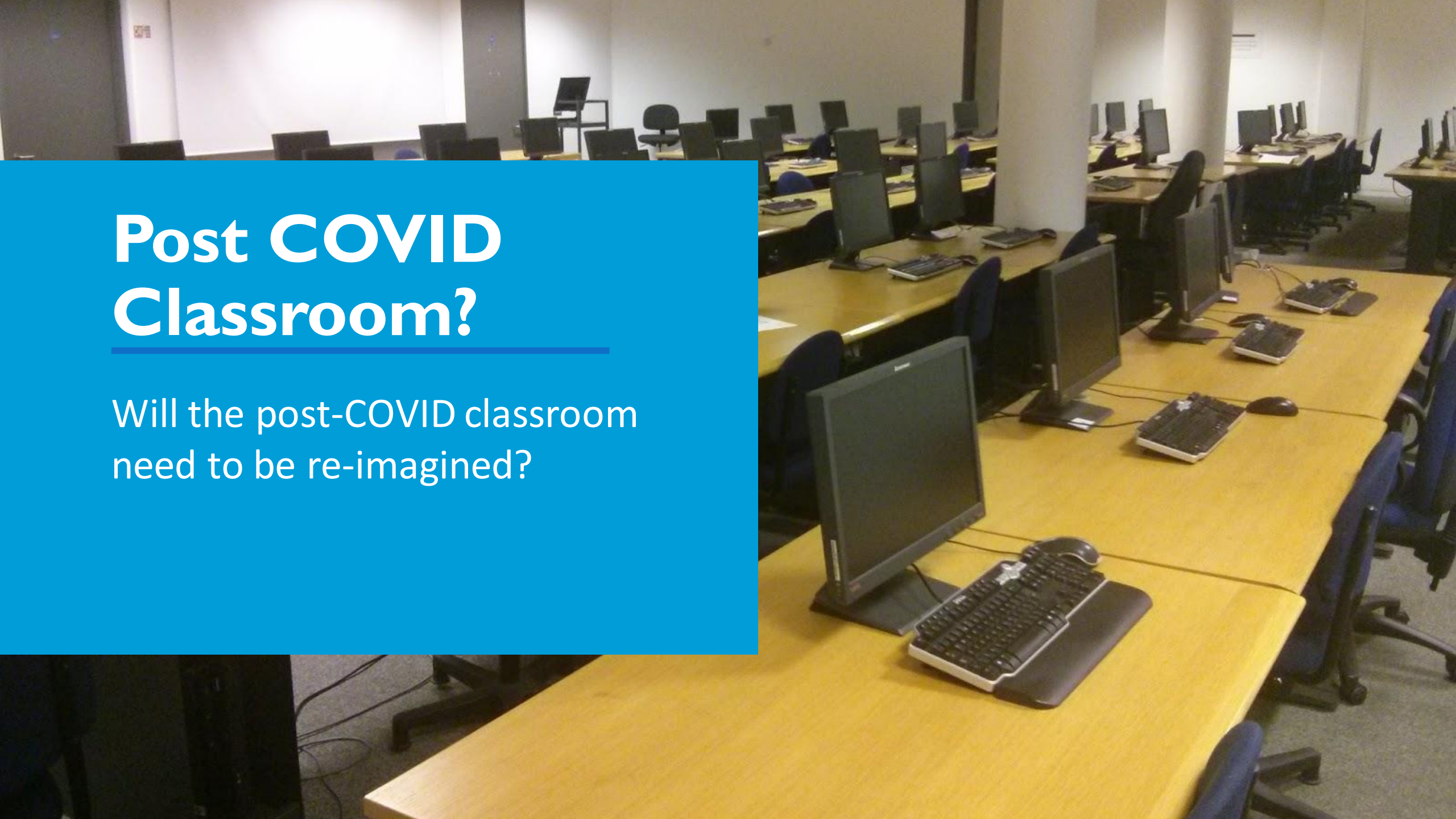
	Pedagogy (FC)	Curriculum
Metacognition	Exams	Exams
Collaborative learning	Peer evaluations	Peer evaluations
Student satisfaction	-	Evaluations
Faculty satisfaction	-	Evaluations
Curriculum evaluation	-	Overall data



Performance & Outcomes

- Faculty and students have to believe in the strategy and vision
- Satisfaction with curricular structure and outcomes is very good.
- Platform utilization: very dependent on integration with the platform.
- Lecturio assign videos, quizzes, and aligned with CUSM courses





Post COVID Classroom?

Will the post-COVID classroom need to be re-imagined?

Lessons learned from COVID

Lessons to take forward into a post-COVID future

Yesterday is history, Tomorrow is a mystery

- Technology and good fortune
- Online virtual experiences have some very good advantages: group participation, unique communication skills can be developed (for faculty and students), polling
- 3 elements from the CUSM experience: Belief, Integration, Technology
  - Students and faculty have to **believe** in the vision (objectives and intended outcomes) and implementation — the where, why, how and when?
  - **Integration** is key: for objectives, content, platforms, curriculum, assessment
  - Exploit the advantages of current and future **technology**

All American
Institute of Medical
Sciences (AAIMS)

Jamaica

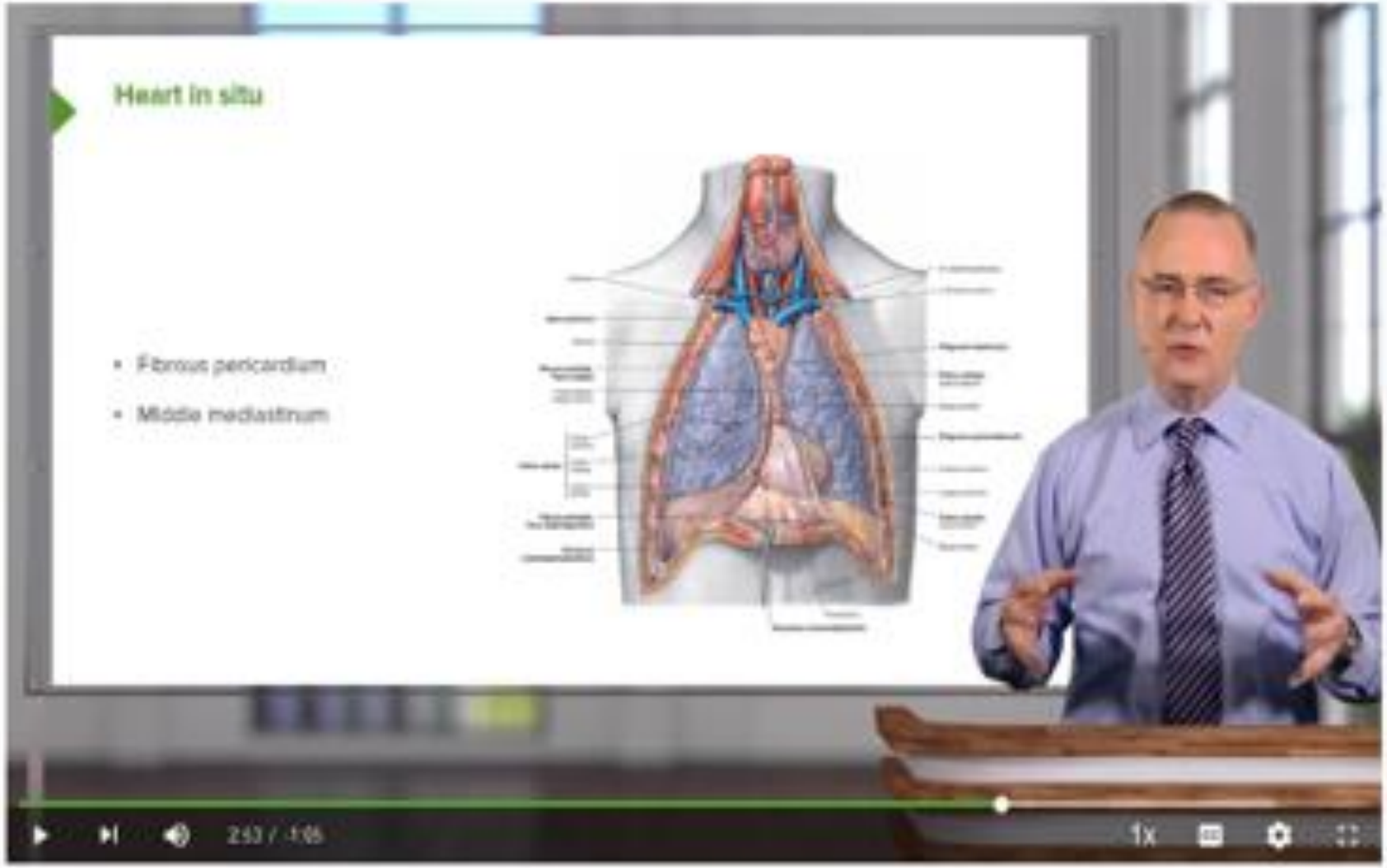
Believe

Students, faculty and staff need to know and be able to see the goal

Council on Foreign Relations website — cfr.org

Teaching Platforms Are The Key!

- Curated content- Quality teaching materials in multiple formats
- Guided delivery
- Evidence-based strategies: Spaced retrieval/ Interleaving
- Data tracking
- Greatly facilitate a student-centered active learning approach such as the flipped classroom

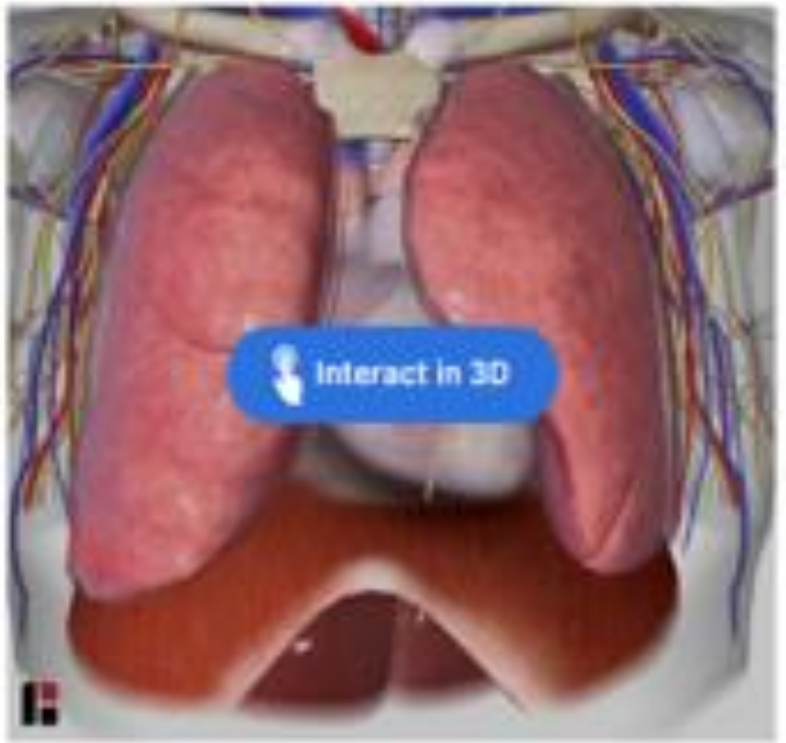


In Situ View – Heart (Cor) by Craig Conley, PhD

ASSIGN

Bookmark | 3D Model | Transcript | Slides | Notes | Report

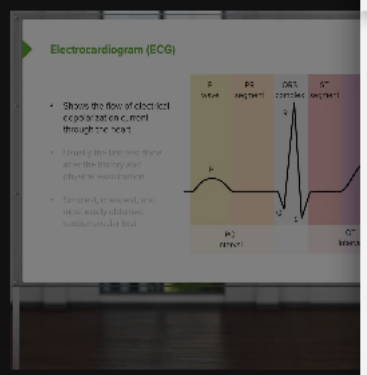
3D Model



Playlist
25 videos

- In Situ View – Heart (Cor)
- Pericardium and Pericardial Cavity – Heart (Cor)

Show Playlist



Electrocardiogram (E
Interpretation

0 of 44 topics completed

0 of 44 videos watched
4 of 100 questions answered

ASSIGN

Educators

Joseph Alpert, MD
Tucson University, Arizona, USA

Unanswered
96

Due Today
3

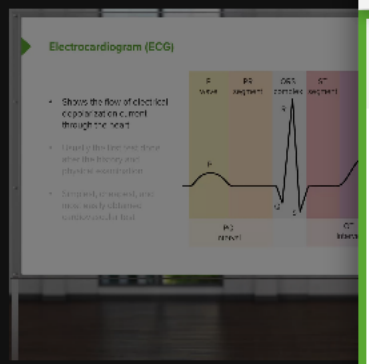
Memorized
1

The T wave corresponds to which of the following?

- Junction between the end of the QRS complex and the start of the ST segment
- (●) Ventricular repolarization
- Time from the start of atrial depolarization to the start of ventricular polarization
- Atrial repolarization
- Atrial depolarization

How sure are you about your answer?

Standard 12 Lead ECG
1 quiz question
0% memorized



Electrocardiogram (E
Interpretation

0 of 44 topics completed

0 of 44 videos watched
4 of 100 questions answered

ASSIGN

Educators

Joseph Alpert, MD
Tucson University, Arizona, USA

Unanswered 96 | Due Today 2 | Memorized 2

The T wave corresponds to which of the following?

- Junction between the end of the QRS complex and the start of the ST segment
- Ventricular repolarization
- Time from the start of atrial depolarization to the start of ventricular polarization
- Atrial repolarization
- Atrial depolarization

WATCH RELATED VIDEO

GIVE FEEDBACK

Correct! Memorized for 23 days!

NEXT

Standard 12 Lead ECG
1 quiz question

0% memorized

ADMINISTRATION

- Statistics
- Content Management
- Assignments
- Patient Notes (Beta)
- User Management
- Settings

CONTENT VIEW

- Home
- Video Library

Assignments

ASSIGN SOME CONTENT | REMIND ALL USERS

Creation Date: Sep 16, 2019 - Sep 16, 2020

Status: All

Author: Kyle Velthouse I kyle.velthouse@aaims.edu.jm

Content:

Assignee: MD 15 ×

RESET FILTERS

Groups | Users

Group assignments

1 completed | 7 in progress | 0 not on track | 0 not started | 5 overdue

Assignee	Content	Progress	Author	Status
MD 15	Restrictive Lung Disease 53:38 min/ 13 videos	26 of 32 completed	KV Sep 2, 2020	
MD 15	Systematic ECG Interpretation 13:47 min	24 of 31 completed	KV Jul 14, 2020	
MD 15	How to Read an Electrocardiogram (ECG): Introduction 09:11 min	Due: Jul 15, 2020 31 of 31 completed	KV Jul 14, 2020	

Overall Assignment Progress

Assignment: Systematic ECG Interpretation

Due:

Assignment date: Jul 14, 2020

Author: Kyle Velthouse

25 completed

1 in progress

0 not on track

6 not started

0 overdue

Overall status

Filters

Learners Performance

Contents Performance

Performance

EXPORT THIS VIEW | SHOW DETAILS

Content:

All assigned content

Learners:

All

User Performance

Learner	Status	Videos	Questions					
		% Watched	Correct	(%)	Incorrect	(%)	Unanswer...	(%)
MD 15		79	168	75	0	0	56	25

10

Content Performance

Content	Videos	Questions						
	% Watched...	Correct	(%)	Incorrect	(%)	Unanswere...	(%)	
Systematic ECG Interpretation	68	168	65	0	0	91	35	

Overall Assignment Progress

Assignment: Systematic ECG Interpretation

Due:

Assignment date: Jul 14, 2020

Author: Kyle Velthouse

- 25 completed
- 1 in progress
- 0 not on track
- 6 not started
- 0 overdue

Performance

EXPORT THIS VIEW | SHOW DETAILS

Content:

All assigned content > Systematic ECG Interpretation

Learners:

All

User Performance

Learner	Status	Videos	Questions					
		% Watched	Correct	(%)	Incorrect	(%)	Unanswer...	(%)
MD 15		79	168	75	0	0	56	25

10

Overall status

Filters

Learners Performance

Contents Performance

Content Performance

Questions	Correct	(%)	Incorrect	(%)	Unanswered...	(%)
Interpreting an ECG requires a systematic approach. Which of the following would not be included in such an approach?	24	65	0	0	13	35
The standard voltage calibration is such that 10 mm is equal to how many mV?	24	65	0	0	13	35
Which of the following is the most appropriate way to ascertain the heart rate on an ECG?	24	65	0	0	13	35
On an ECG, how many seconds does each small box represent?	24	65	0	0	13	35
On an ECG, how many seconds does each large box represent?	24	65	0	0	13	35
On an ECG, how many small boxes are in each large box?	24	65	0	0	13	35
On an ECG, what is the range, in degrees, of a normal axis?	24	65	0	0	13	35

Filter by:

Date Range

Last 12 Months

Group

MD 15

User in MD 15

ALL

Curricula

ALL

Topics

ALL

Subtopics

ALL

Qbank Question Topics

ALL

Overview | Performance by Course | Performance by User | Performance on Recall Questions

Lectures

Systematic ECG Interpretation

Recall Questions

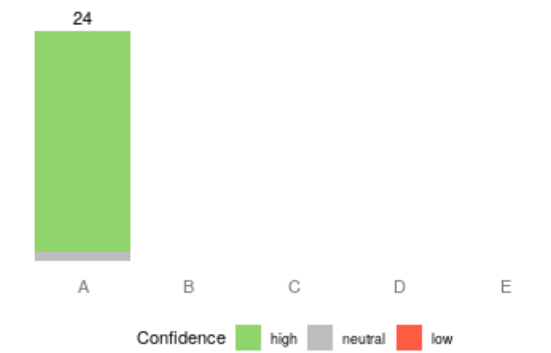
Interpreting an ECG requires a systematic approach. Which of the following would not be included in such an approach?

Selected Users:

Total	32.0
Finished the Lecture	25.0
Answered the Question	24.0
Answer Attempts (Average)	2.3

First Attempt Answers

Last Attempt Answers



option	answer
A	**Avoiding comparison with prior tracings**
B	Checking the voltage calibration
C	Determining the rhythm
D	Calculating the heart rate
E	Determining the timing intervals

ADMINISTRATION

- Statistics
  - Users
  - Content
  - Qbank
  - Simulations
  - Dashboard
- Content Management
- Assignments
- Patient Notes (Beta)
- User Management
- Settings

CONTENT VIEW

- Home
- Video Library

User Statistics

Sep 15, 2019 - Sep 15, 2020

Active Users	Started Lectures	Answered Recall Questions	Answered Qbank Questions	Viewed Articles
184	99,661	393,247 59 % correct	11,221 56 % correct	806

Groups | Users

Name	Videos			Recall Questions		Articles	Qbank Questions	
	Started	Finished	Watched Minutes	Answered	% correct	Viewed	Answered	% correct
Admin	305	253	1,645	70	73 %	11	36	36 %
Clerkships	12,306	11,942	62,902	15,689	73 %	9	3,580	62 %
Faculty Staff	2,247	1,488	9,332	6,661	69 %	90	441	74 %
MD 13	16,059	14,481	86,893	53,900	60 %	31	3,152	62 %
MD 14	13,595	12,874	75,354	51,722	50 %	29	305	47 %
MD 15	32,725	30,921	187,173	143,461	59 %	221	834	38 %
MD 16	12,292	11,848	66,112	60,153	55 %	38	113	31 %
PM 13	11,198	10,777	56,882	52,459	65 %	243	36	31 %
PM 14	5,881	5,796	32,420	32,750	57 %	19	27	15 %
USMLE 1 Review	5,169	4,992	26,720	11,034	82 %	5	3,363	53 %

The key advantage to implementing a flipped classroom is creating an environment for productive interactivity

The Flipped Classroom Approach

Students Learn Before Class

Students prepare to participate in classroom activities

- **Pre-assign content**

Faculty Gets Insights Before Class

Faculty see what's understood and typical mistakes

- **Utilize supporting analytics**

Class Time is Targeted & Efficient

Students practice applying key concepts with feedback

- **Focus on key concepts based on data**

Students Process New Knowledge

Students check their understanding

- **Reinforce learning**

Warning!! Before trying this, get organized and get help

When done properly, students and faculty love it and students perform better.

- **Key points:**
  1) **Demonstrate the importance- cite the science-based evidence.**
  2) **Simplify the process- obtain the right tools for implementation**
  3) **Modify it to fit your circumstances**
  4) **Introduce it incrementally**
  5) **Have realistic expectations**
  6) **Track the results and be willing to adjust**
  7) **Be patient and persistent**

COVID 19
What will be its Silver Lining?

Teacher Directed Methods & Materials

⬇

Active Student-Centered Learning

COVID 19
What will be its Silver Lining?

Flipped Classroom

↓

Interactive Classroom

↓

Experiential Learning

COVID 19
What will be its Silver Lining?

We Adopt an Evidence-Based Approach to Teaching and Learning

Polling questions?

How do you think the effectiveness of an Interactive/Flipped Classroom could best be measured?

A. Performance on exam
B. Student satisfaction
C. Student communication
D. Variable Depending on the objective
E. All of the above

Polling questions?

What are the biggest challenges you see to implementing an Interactive/Flipped Classroom approach in your institution?

A. Faculty resistance
B. Student resistance
C. Lack of training resources and understanding
D. Lack of supporting technology
E. Lack of administrative support

Reflections:

What will YOU do to change the way medicine is taught?

If YOU don’t, someone else will…

Let us know how we can help!
Please send us your suggestions

peter.horneffer@aaims.edu.jm | ettarhr@cusm.org