Re-envisioning Medical Education: Transforming Constraints into Opportunities

Part I – Transforming the Current Reality

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

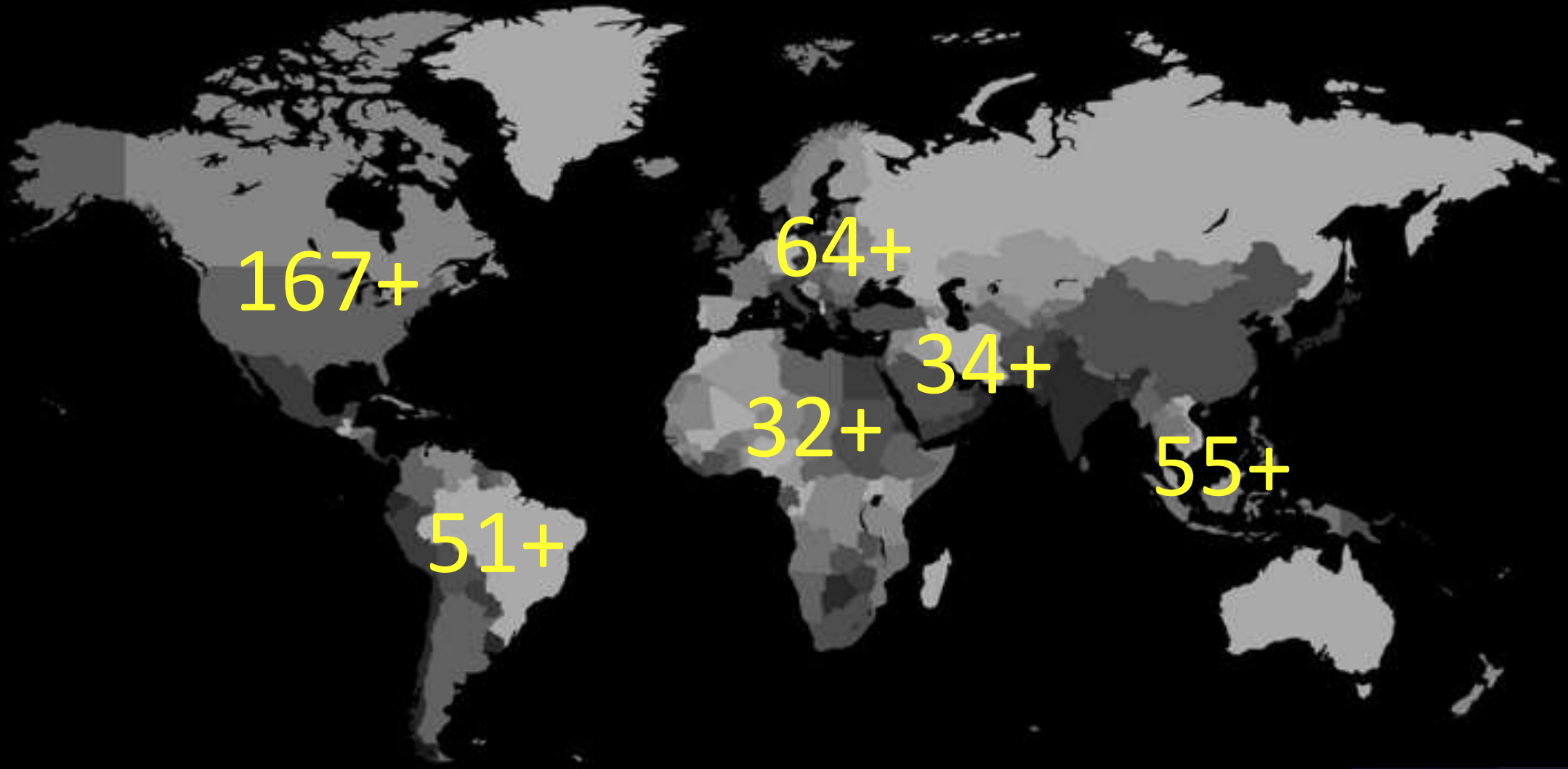
Director
Medical Education Programs
Lecturio.com

Cardiac Surgeon, Sinai Hospital
Baltimore, Maryland

Atsusi "2c" Hirumi, PhD
Professor
Instructional Design & Technology
Medical Education | Learning Sciences
College of Medicine | College of Education
University of Central Florida

Professor Extraordinarious
Dept. of Financial Accounting
College of Accounting Sciences
University of South Africa (UNISA)

A Global Community – We're in this together.



VectorStock® VectorStock.com/1336495

Who are you?

60 Medical School Deans and Rectors

188 Faculty Members

46 Directors/CEOs

25 Instructional Designers & Curriculum Experts

3 Faculty Development Experts

8 Education Consultants

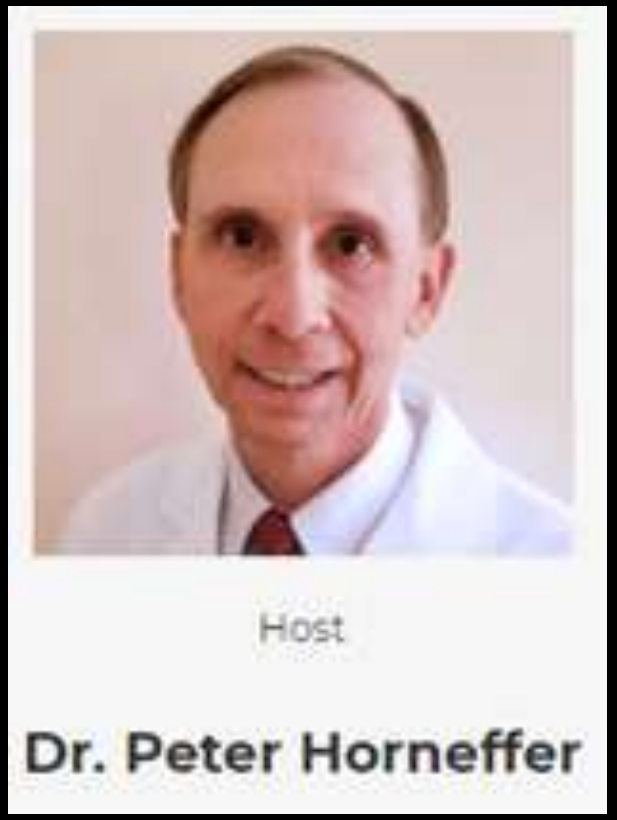
12 Students

61 “Other“

VectorStock® VectorStock.com/1336495

Participants

Disclosures…



Executive Dean
All American Institute
for Medical Sciences, JM

Director
Medical Education Programs
Lecturio.com

Cardiac Surgeon,
Sinai Hospital
Baltimore, Maryland

Professor
Instructional Design & Technology
Learning Science | Medical Education
College of Education | College of Medicine
University of Central Florida

Professor Extraordinarious
Dept. of Financial Accounting
College of Accounting Sciences
University of South Africa (UNISA)

“We were all sent to our rooms by God so that we could think of what we might do better”

Anonymous ICU Nurse

Pre Pandemic

Post Pandemic

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.

Image from: iridiumadvisors.com
no copyright infringement is intended

COVID 19
What will be its Silver Lining?

Effective Evidence-Based Education

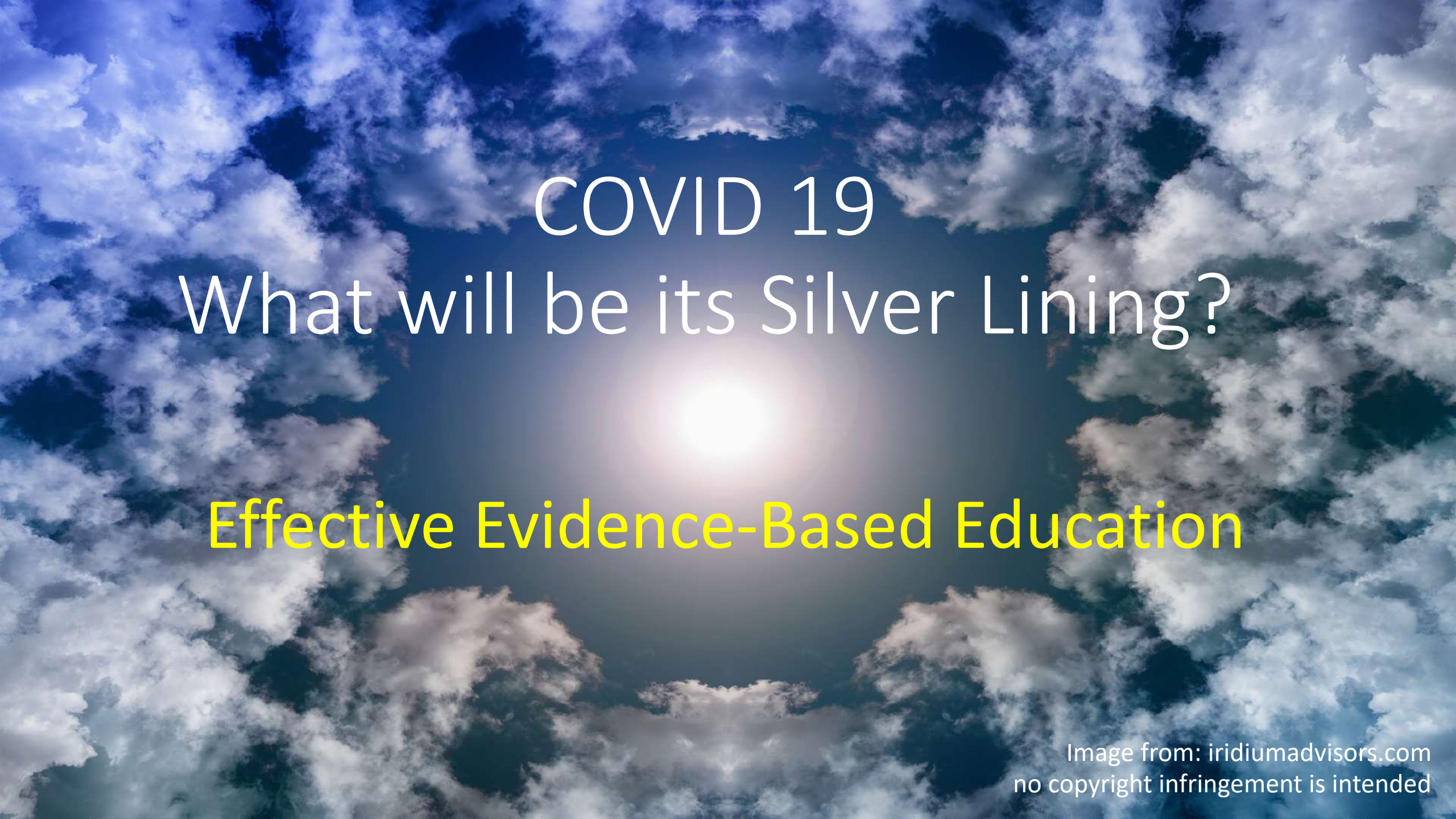
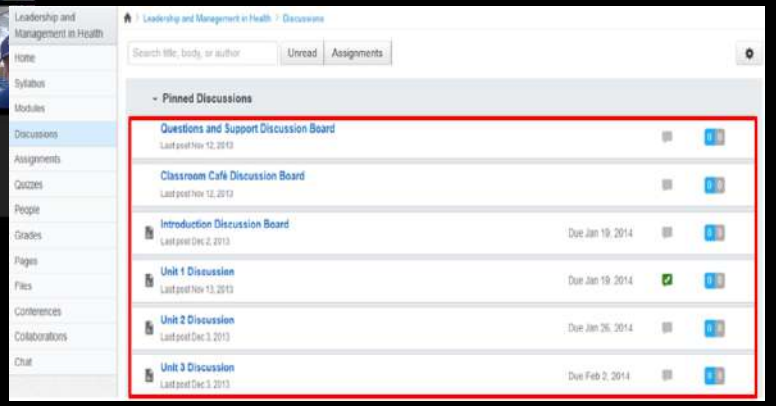


Image from: iridiumadvisors.com
no copyright infringement is intended

The Current Reality



Ethics (Lecture 1: Introduction)

- Ethics (Moral Philosophy)—>commonly divided into three (not unconnected) branches:
  - ***Applied Ethics*** is conc. with what we ought to do (and think) about particular moral issues;
  - ***Normative Ethics*** is concerned with what sorts of moral considerations are important, generally: e.g., which principles we ought to act on, and/or how it is morally good to be;
  - ***Metaethics*** is concerned with what is going on when we do normative and applied ethics (either formally or informally), and involves asking questions about, e.g., the *meaning* of moral language, whether there are any objective moral *truths*, how we *know* about what the right moral principles are, etc.

- Universality: we all have at least some moral views—> For some people, this will be what makes moral philosophy worth thinking about (because it is a branch of philosophy which clearly engages with something of universal concern)

Ma se la morale è di tutti… —>according to someone, this will be a reason to doubt that philosophy has much to offer: *"Most people manage to think about moral issues quite well, without studying moral philosophy: why should we think that philosophers know more about morality than anyone else?"*

Making use of moral theories and arguments, farne uso al fine di giustificare determinati ragionamenti morali oltre che per "capirci di più": Perhaps the importance of moral philosophy for moral thinking more generally is that moral thinking makes use of – or could usefully make use of – moral *theories* and *arguments*.

- Generality of moral theories: But can moral *theories* be any use to moral thinking? Are they too **general** to be of use? Aren't all moral cases different?
  - *Even if all the cases are different in many respects, it does not follow that there are no general principles which govern them;*
  - *And anyway, there is no reason to think that all moral theories are highly general: moral philosophers often discuss very specific issues, without invoking completely general theories; some theories are theories about very specific things!*

Che effetti hanno i nostri pensieri? Se pensiamo a qualcosa—>morality thinking ci aiuta a capire meglio noi stessi, e, di conseguenza, a capire meglio gli altri.

- Moral theory and evidence: metodo in qualche modo "scientifico", analogo a quello utilizzato dalle scienze naturali. Rather than making *empirical* predictions which are tested by observation, moral theory delivers results which we can test for their acceptability in particular cases.

- Moral philosophy is difficult: not because it involves a great many technical manoeuvres, like logic or some metaphysics and philosophy of language; but because it calls for **good judgement**.

There is not a teachable algorithm or technique for good judgement; knowing what is worth taking seriously in morality calls for sensitivity, honesty and experience of serious moral thought. (These are not things which only philosophers have!)

Emergency Remote Teaching[1,2]

What should we keep, improve & discard?

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. Assess Patient's Needs	1. Assess Educational Needs
2. Ask Questions	2. Ask Questions
3. Acquire Evidence	3. Acquire Evidence
4. Appraise Evidence	4. Appraise Evidence
5. Apply Evidence	5. Apply Evidence

Credit

Feroza Daroowalla, MD, MPH
Associate Professor
Dept. Medical Education
College of Medicine
University of Central Florida

Practices pulmonary, critical care and palliative medicine

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. Asses Patient's Needs	1. Assess Educational Needs
2. Ask Questions	2. Ask Questions
3. Acquire Evidence	3. Acquire Evidence
4. Appraise Evidence	4. Appraise Evidence
5. Apply Evidence	5. Apply Evidence

Transforming the Current Reality

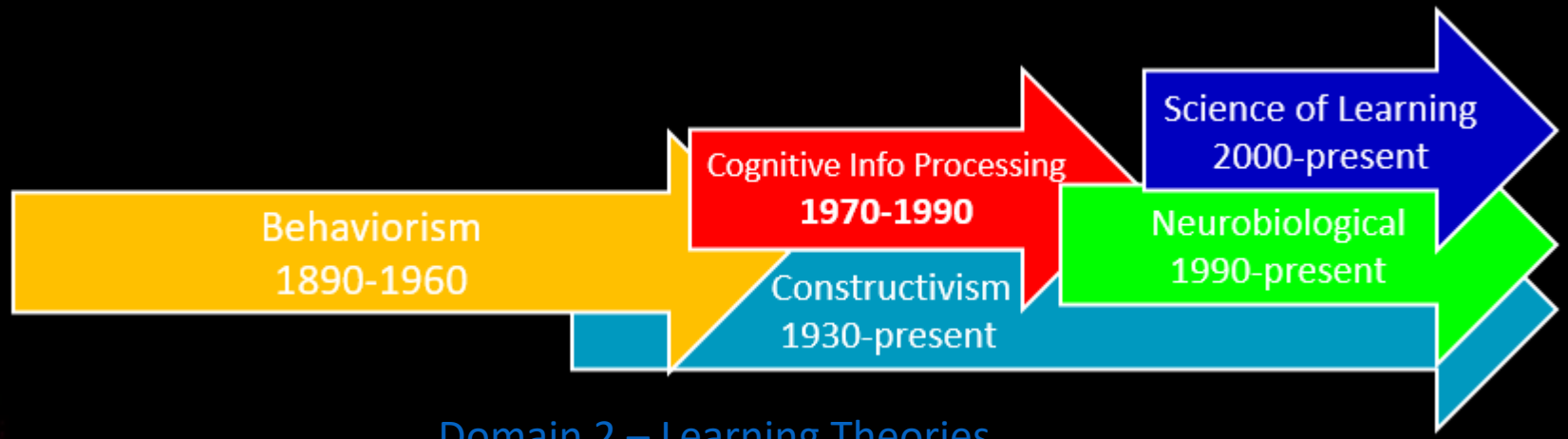
One Framework: Evidenced-Based Medical Education

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

EBM	EBME
1. Asses Patient's Needs	1. Assess Educational Needs
2. Ask Questions	2. Ask Questions
3. Acquire Evidence	3. Acquire Evidence
4. Appraise Evidence	4. Appraise Evidence
5. Apply Evidence	5. Apply Evidence

Transforming the Current Reality (3. Acquire Evidence)

Domain 1 – Outcomes



Domain 2 – Learning Theories

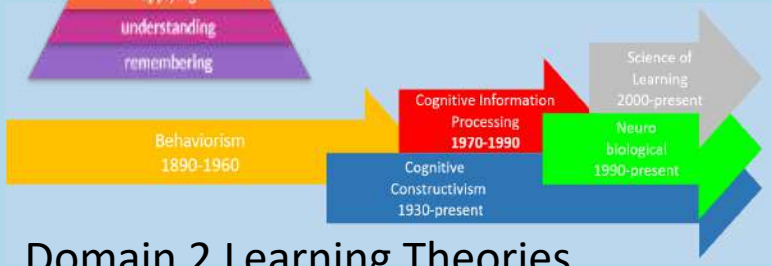
Domain 3 – Instructional Approaches

Figure 1. Domains of Evidence

Practice 1 & 2 Findings

Practice 3 – Acquire Evidence

Domain 1 Outcomes



Domain 2 Learning Theories

Domain 3 Instructional Approaches

Practice 4 – Appraise Evidence

Scale	Factors
Quality of Evidence Ranging from 1—2—3 low----high	Appropriateness of sample size, sampling method, data collection, data analysis, and conclusions. Reliability and validity of instruments, procedures, data and findings.
Strength of Evidence Ranging from 1—2—3 low---high	Reported research design, ranging from meta-analysis and systematic review of research, to experimental and quasi-experimental studies, to case studies and ethnographies, to professional judgement and anecdotal reports.
Relevance of Evidence Ranging from 1—2—3 low---high	Consistency of reported methods (including subjects, intervention, measured outcomes) to target learner population, intervention, outcom and conditions.

Requirements inform Practice 5

Figure 2. The cyclical process of acquiring and appraising evidence to define design requirements

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. Asses Patient's Needs	1. Assess Educational Needs
2. Ask Questions	2. Ask Questions
3. Acquire Evidence	3. Acquire Evidence
4. Appraise Evidence	4. Appraise Evidence
5. Apply Evidence	5. Apply Evidence

Transforming the Current Reality (5. Apply Evidence)

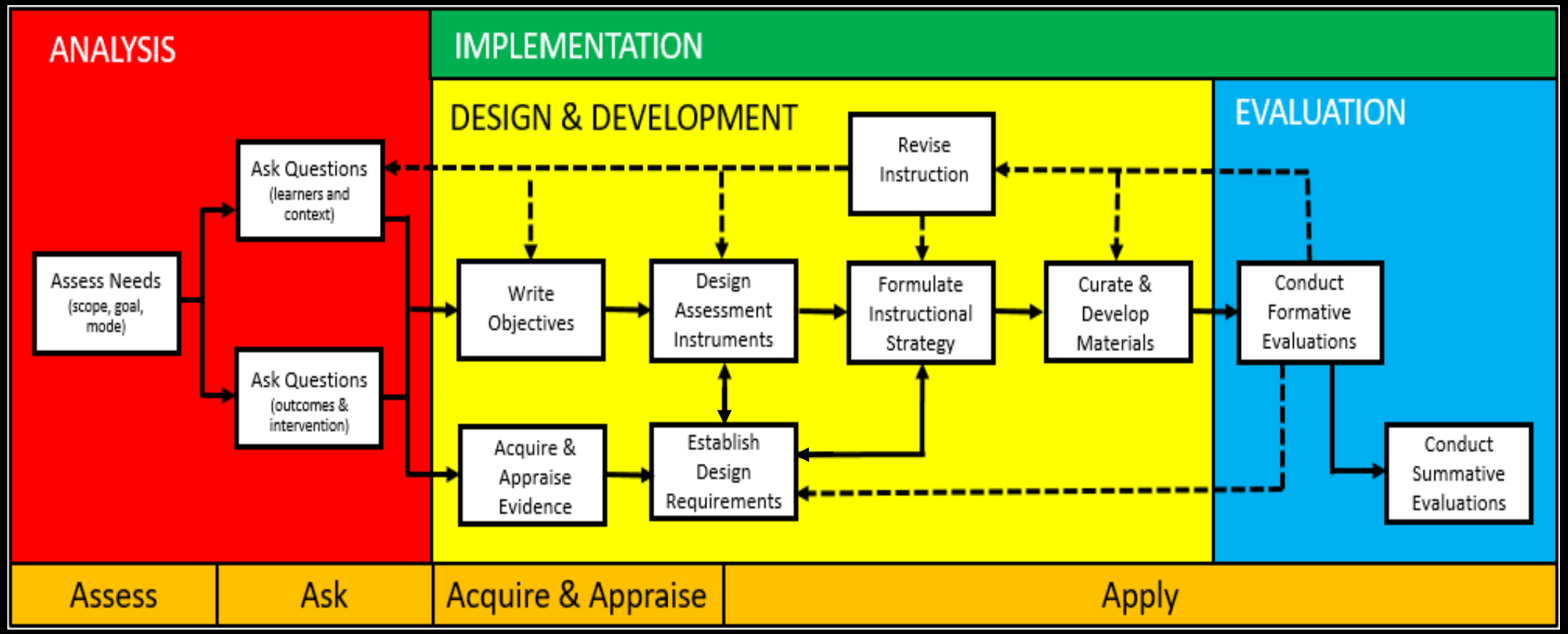


Figure 3. Key tasks associated with the systematic instructional design process[2]

Transforming the Current Reality (5. Apply Evidence)

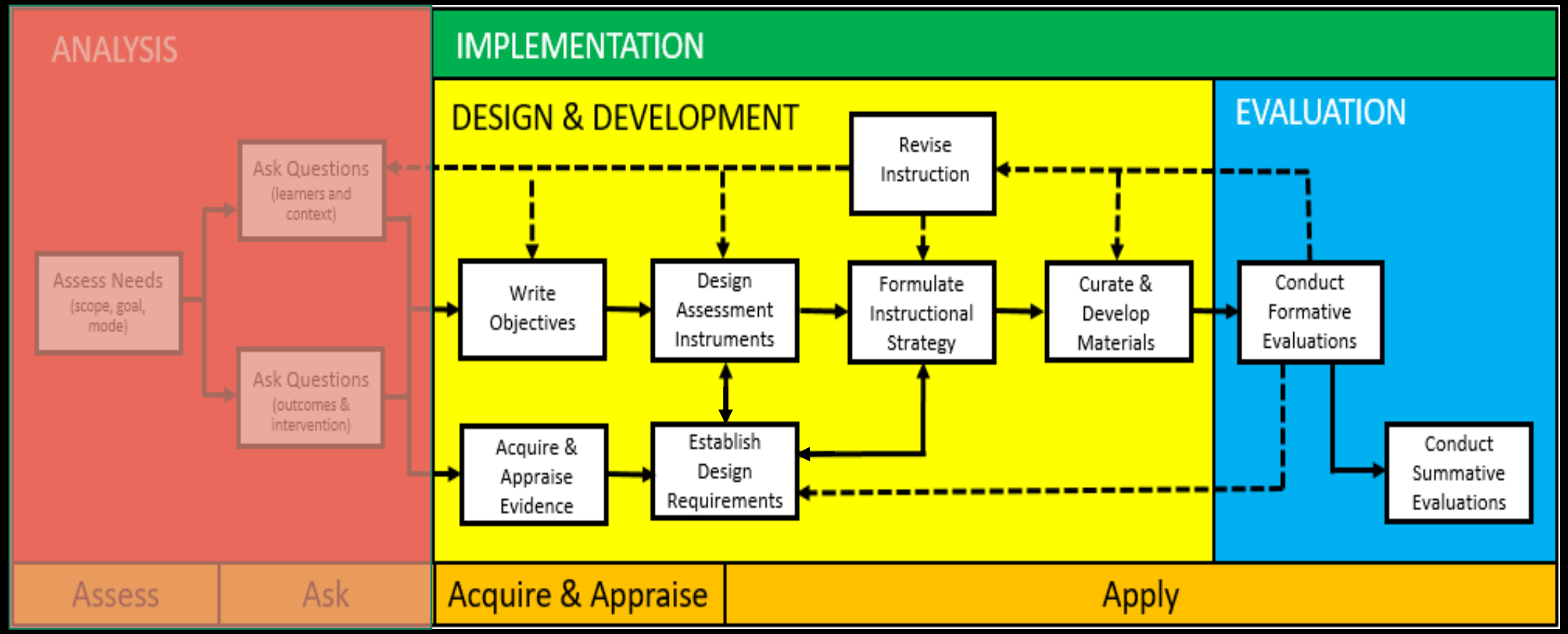


Figure 2. Key tasks associated with the systematic instructional design process

Transforming the Current Reality (5. Apply Evidence)

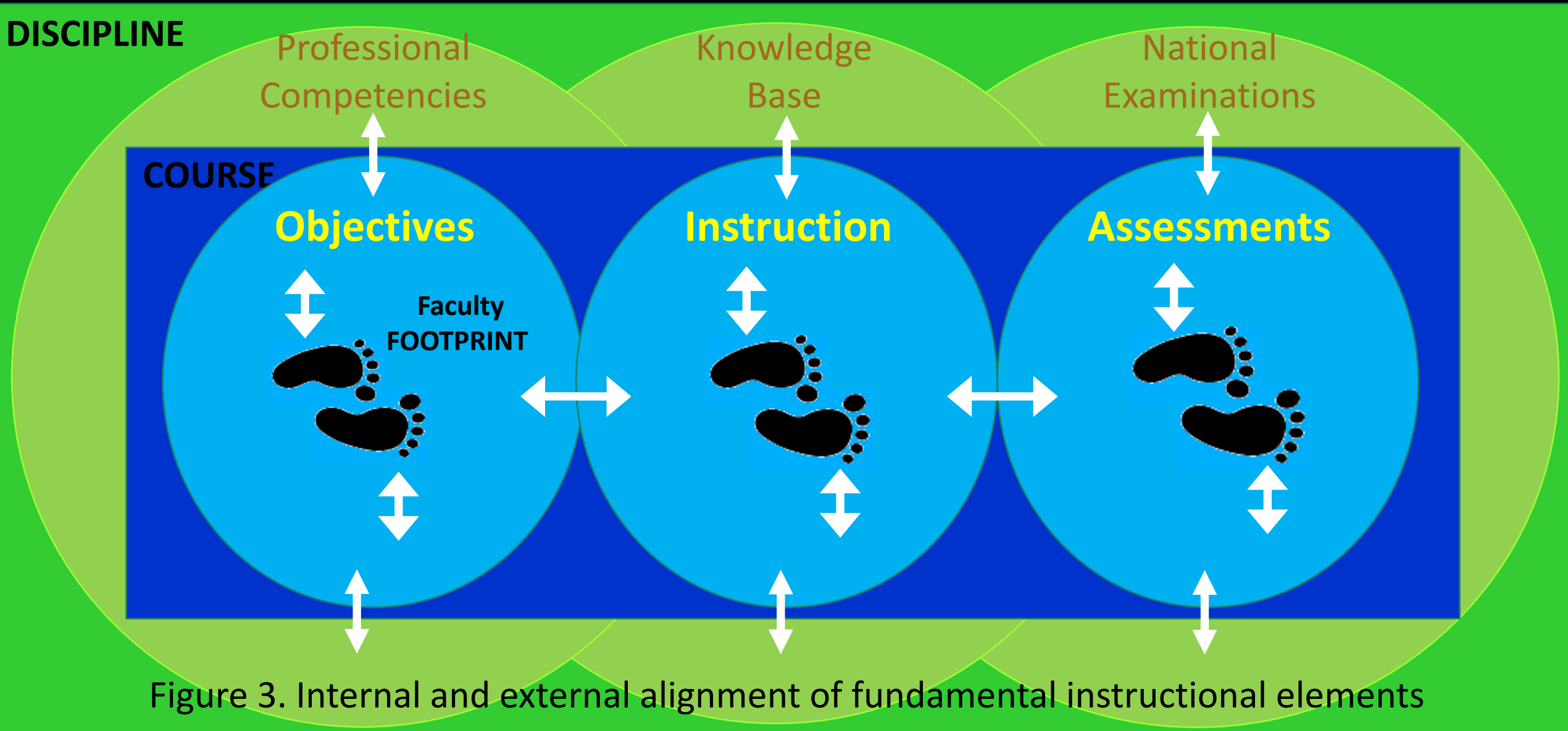
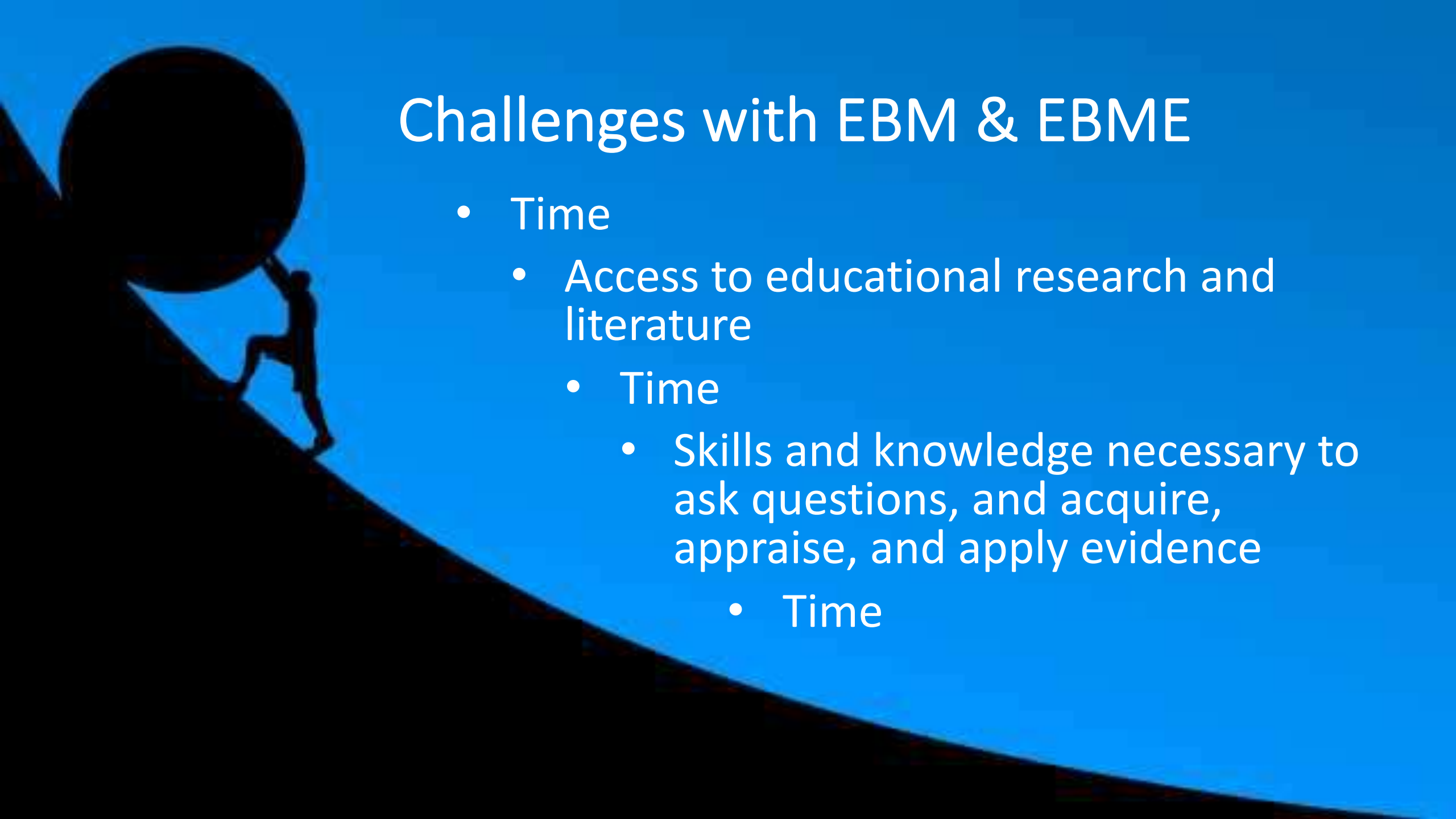


Figure 3. Internal and external alignment of fundamental instructional elements



Challenges with EBM & EBME

- Time
  - Access to educational research and literature
    - Time
      - Skills and knowledge necessary to ask questions, and acquire, appraise, and apply evidence
        - Time

Resources for facilitating EBME

Instructional Designers[4]

- Analyze learners, goals, context
- Define objectives
- Design and align assessments and strategies
- Acquire and appraise evidence
- Curate and develop materials.
- Align instructional elements
- Align research, theory, and practice

Learning Platforms

- Curated high quality content
- Guided delivery
- Built-in evidence-based learning strategies and instructional design
- Data tracking and feedback
- Deliverable remotely !COVID-19!

BOOKMATCHER

Search

- Home
- Study Planner
- Video Library
- Question Bank
- Spaced Repetition
- Bookmarks
- Performance
- Patient Notes (Beta)
- Administration
- Simul

What Science of Learning (SoL) principles do you see?

Study Planner
1 personal task

Qbank Test Assignment 08/18/2019
2 questions Due: 08/19/2019

SHOW ALL

Question Bank
Apply your knowledge

0% Latest Test
May 27, 2020

OPEN QUESTION BANK

Video Library
Pre-Medical / Generic

- Medical School Survival Guide
- Biochemistry: Basics
- Calculus
- Chemistry
- Histology
- Microbiology

BROWSE LIBRARY

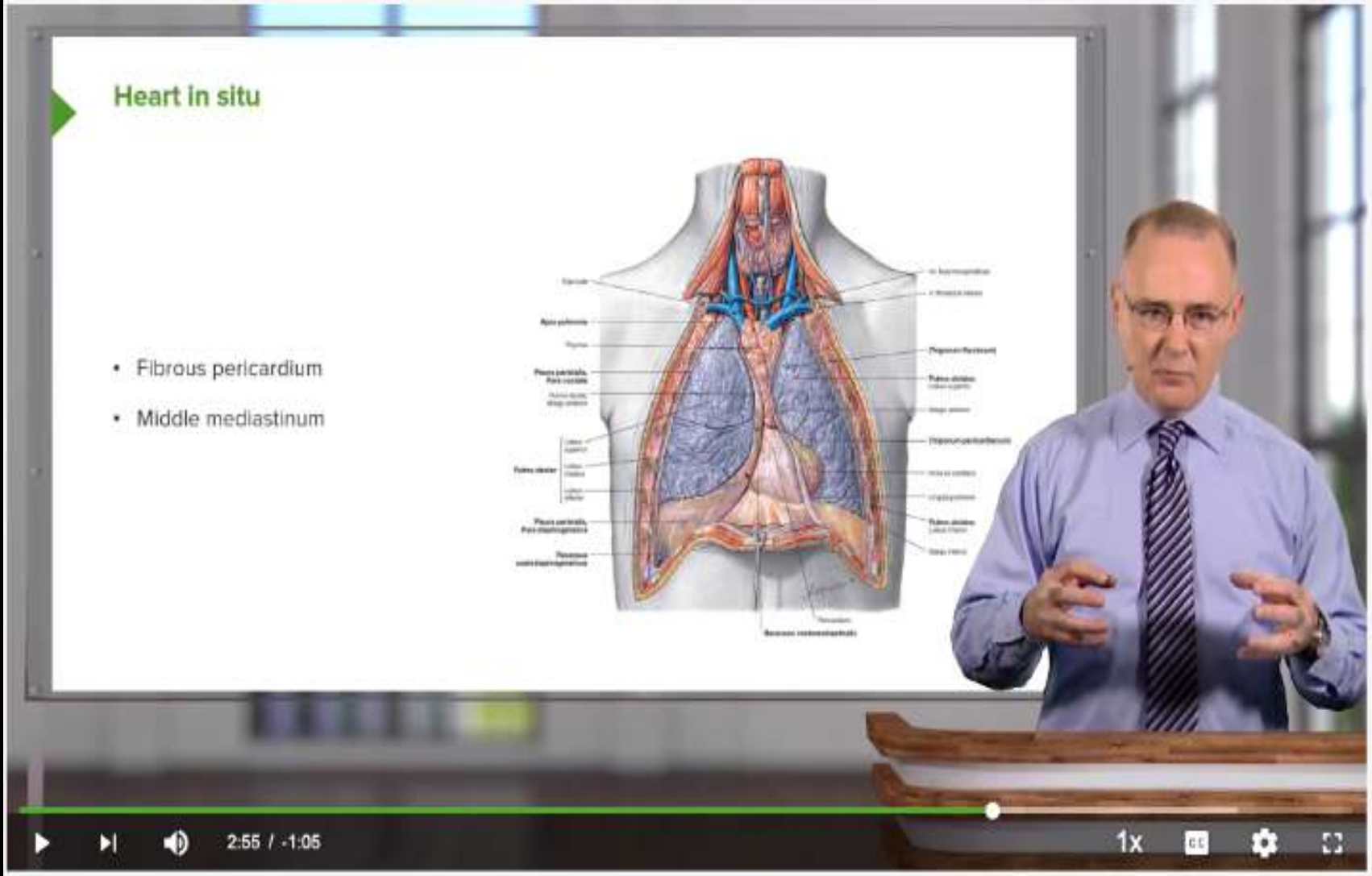
Spaced Repetition
Maximize your recall power

9%
memorized

23 quiz questions in your deck

21 Due Today | 2 Memorized

REVIEW DUE QUESTIONS



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

ASSIGN

Bookmark 3D Model Transcript Materials Notes Report

3D Model

Thorax

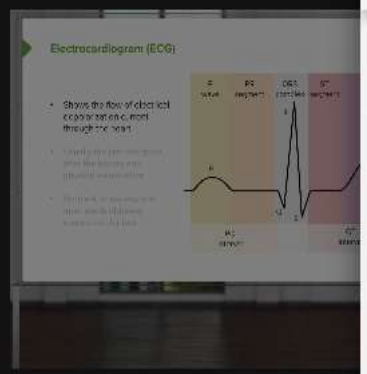
The thorax is the region of the trunk that extends from the neck

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!

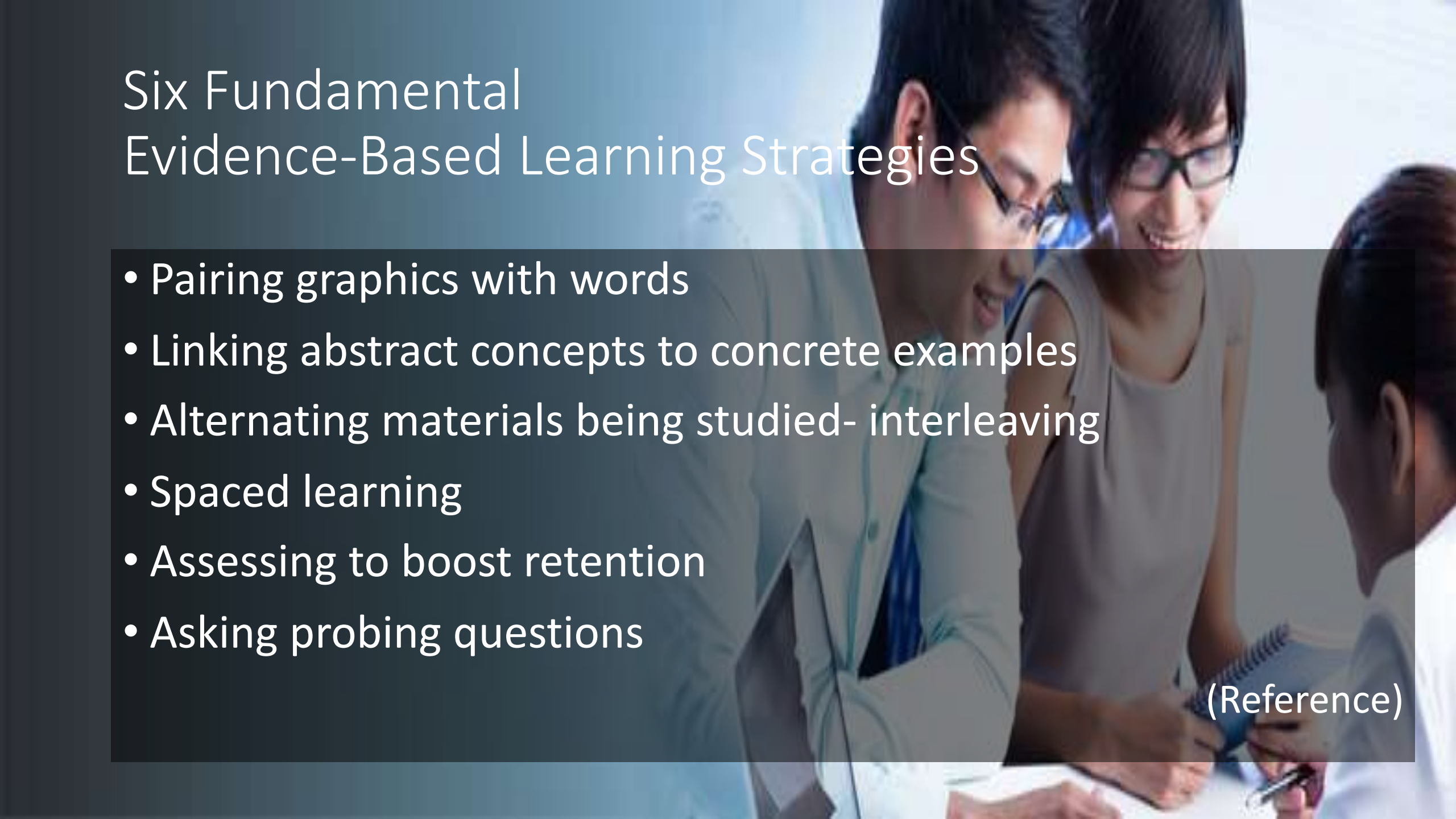
NEXT

Standard 12 Lead ECG
1 quiz question

0% memorized

17:49
153 / 95
156
44
74
DIALOGUE
PHYSICAL EXAM
MONITORING
TESTS
CALL
INTERVENTION
MEDICATION

Six Fundamental Evidence-Based Learning Strategies



- Pairing graphics with words
- Linking abstract concepts to concrete examples
- Alternating materials being studied- interleaving
- Spaced learning
- Assessing to boost retention
- Asking probing questions

(Reference)

All American Institute of Medical Sciences (AAIMS)

Jamaica

ADMINISTRATION

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

CONTENT VIEW

- Home
- Video Library

User Statistics

May 30, 2019 - May 30, 2020

Active Users	Started Lectures	Answered Recall Questions	Answered Qbank Questions	Viewed Articles
187	73,893	242,727 61 % correct	10,612 60 % correct	500

Groups | Users

Name	Videos			Recall Questions		Articles	Qbank Questions	
	Started	Finished	Watched Minutes	Answered	% correct	Viewed	Answered	% correct
Admin	69	36	242	60	67 %	14	38	37 %
Clinical Rotations	4,365	4,128	21,736	4,051	85 %	4	2,129	61 %
Faculty Staff	869	338	2,618	1,924	76 %	68	1,064	79 %
MD 10	3,208	3,166	15,553	58	78 %	0	1,043	51 %
MD 11	3,278	3,248	15,811	361	73 %	0	914	51 %

Polling Questions

1. Do you think that medical education will emerge from the pandemic in an improved state?
2. Do your colleagues base their educational methods on evidence-based practices?
3. Do you currently have an instructional designer on staff to facilitate evidence-based education?
4. Do you employ a learning platform to facilitate curriculum delivery?

Reflections:

1. Based on what you are doing now, what would you like to…
   A. Keep?
   B. Modify?
   C. Eliminate completely?
2. What new approaches would you like to try?
3. What barriers are keeping you from trying those approaches?

June 17th, 1 pm ET (6 pm UK time)

Next week we will discuss active student-centered learning and focus on ways to implement and augment a "flipped classroom"

References

1. Hodges C, Moore S, Lockee B, Trust T, Bond, A, The Difference Between Emergency Remote Teaching and Online Learning. *EDUCAUSE Review,* March 2020.
2. Means B, Bakia M, Murphy R, *Learning Online: What Research Tells Us about Whether, When and How* , New York: Routledge; 2014.
3. Branch RM, Dousay TA, "Survey of Instructional Design Models," Association for Educational Communications and Technology (AECT); 2015.
4. Love LM, Anderson MC, Haggar FL. The strategic role of instructional designers, *Academic Medicine* 94(1):146, January 2019. doi: 10.1097.