

A man in a white lab coat is looking down at a molecular model he is holding. The background is a blurred classroom with a chalkboard and other people.

Workshop

A Paradigm Shift in Medical
Education: Internet-based
Platforms at the Core of the
Educational Process

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Association for Medical Education in Europe (AMEE) Annual Conference
Lyon, France • August 27-31, 2022

Disclosure Statements



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The Perspectives



30 years
evidence-based
research, theory,
and practice;
Technological
advances

+



Everyday struggles
of integrating an
eLearning platform in
a changing
environment

What is a platform?



Software (e.g., ScholarRx, Lecturio, AMBOSS) that offers faculty and students a place to access, share, and practice recalling **content** information, facilitate **assessments**, track **usage** and **outcomes**, and provide **data analytics** to optimize **learning**

Workshop Goals

1. Share knowledge and experience with hybrid (aka. flipped learning) and platform-based content delivery (30 minutes)
2. Form small groups to curate and create flipped/hybrid lesson with **solutions for platform integration** (30 minutes)
3. Reflect on and share advantages and challenges to platform integration based on hybrid learning experience (30 minutes)

*For purposes of this session, **platform integration** describes what the instructor and learner do both **before and after** interacting with the platform.*



Director of Technology
Center for Professional
Development
5 Year \$1.57 million
US Dept. of Education

Integrating
Technology

Co-I NERVE
Neurological Rehearsal
Virtual Environment
5 Year \$1.5 million
NIH Grant

Virtual Patient
Simulation

Leveraging human
resources and time to
ensure quality (i.e.,
effectiveness,
efficiency, &
engagement)

AVIDesign

Enhancing productivity
by **integrating** 3rd party
commercial learning
platforms

CBME

E-Learning

E-Learning Interactions
Online/Hybrid Learning
InterPLAY engaging w/
story, play & game

MedED-COTS

Integrating Clinical
Cases

Analyzing Pedagogical
Foundations

BEME Focused Review

Faculty and students'
use and perceptions
of 3rd party commercial
learning platforms



Evidence-Based Learning Platforms

Can:

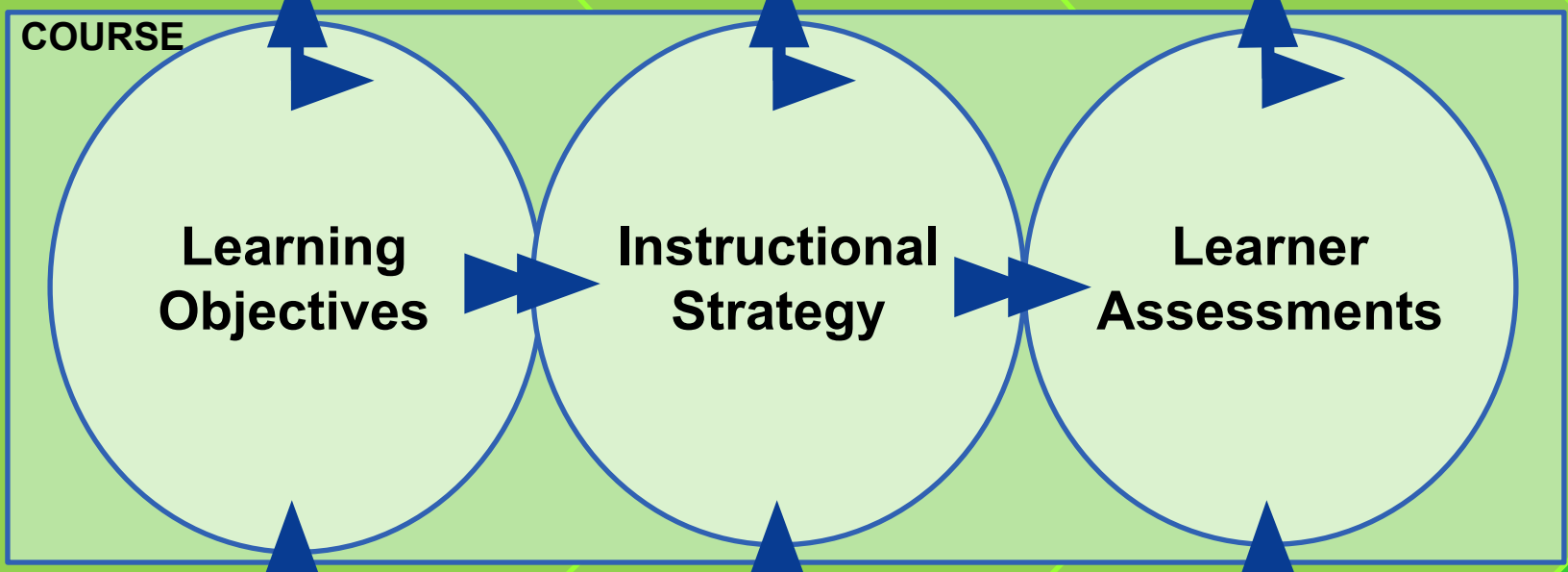
- Enhance recall of **foundational science** (BEME Guide #72, 2022)
- Facilitate **hybrid learning** & time variable CBE
- **Reduce faculty time** spent preparing lectures and SLMs
- Increase **access, productivity, and affordances**

Cannot:

- Affect faculty and students' **perceptions** of platform use
- Ensure effective **integration** (e.g., what instructor and students do before and after platform use)
- Guarantee **quality** of the learning experience.

PRACTICE

Personal and Professional Goals, Interests, Standards and Requirements



Research and Theory on Teaching, Learning and Instructional Design

Vertical and horizontal alignment of instructional elements characteristic of high quality (effective, *efficient*, and *engaging*) learning experiences⁴

PRACTICE

Personal and Professional Goals, Interests, Standards and Requirements

COURSE

Learning
Objectives

Instructional
Strategy

Learner
Assessments

Research and Theory on Teaching, Learning and Instructional Design

Vertical alignment of instructional elements with research and theory to ensure effectiveness (aka evidenced-based medical education)

What is the Difference?



Conventional
Classroom



Modern Online
& Hybrid

Spontaneity of Interactions

- interpret verbal and non-verbal cues
- clarify expectations
 - address individual needs/concerns
 - provide insights & elaborations
 - give directions
 - facilitate discussions
 - present immediate feedback



eLearning

- Limited real-time (synchronous) spontaneous interactions
- Interactive technologies do not ensure meaningful interactions
- Interactions must be planned and sequenced to facilitate elearning

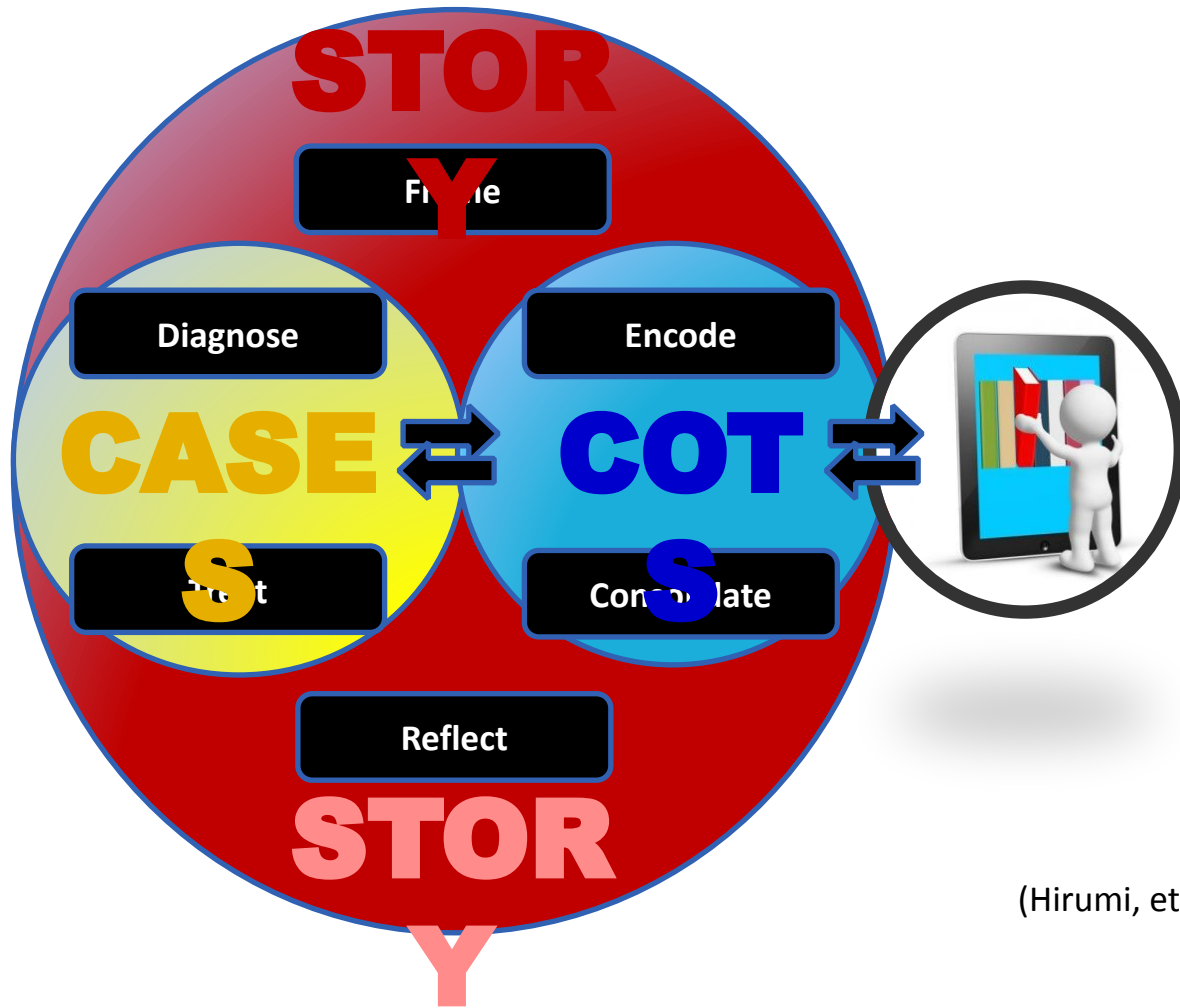


Without interactions, instruction may simply become "passing on content as if it were dogmatic truth, and the cycle of knowledge acquisition, critical evaluation and knowledge validation, that is important for the development of higher-order thinking skills, is nonexistent."

(Shale & Garrison, 1990, p. 29)

- Curriculum integration was one of the top three weighted characteristics of high fidelity, virtual patient simulations (VPs) that lead to effective learning (Issenberg et al., 2005).
- VPs that are simply “add-ons” result in poor integration and suboptimal learning outcomes (Haag et al. [2007](#)).
- Explicit and deliberate strategies for integrating Learning Platforms are essential for students’ acceptance and learning.

- **Instructional Design Principles**
(see Universal Principles of Experiential Learning, p. 10)
- **Grounded Strategies for Facilitating Evidence-based Design**
(see Learning-Centered Experiential and Problem-Based Strategies, p. 2)



InterPLAY Instructional Events
 (Hirumi, et al. 2017a, 2017b, 2016a, 2016b)



How can we share resources to make medical education more accessible?

Oceania University of Medicine-Samoa
All American Institute of Medical Sciences-Jamaica

Platform delivery and tracking of a learning science-based approach

Modular mastery-based curriculum

Challenge

Experience

Dissemination

Solution v3

Challenge

How do we make learning more efficient and effective?

Initial Solution

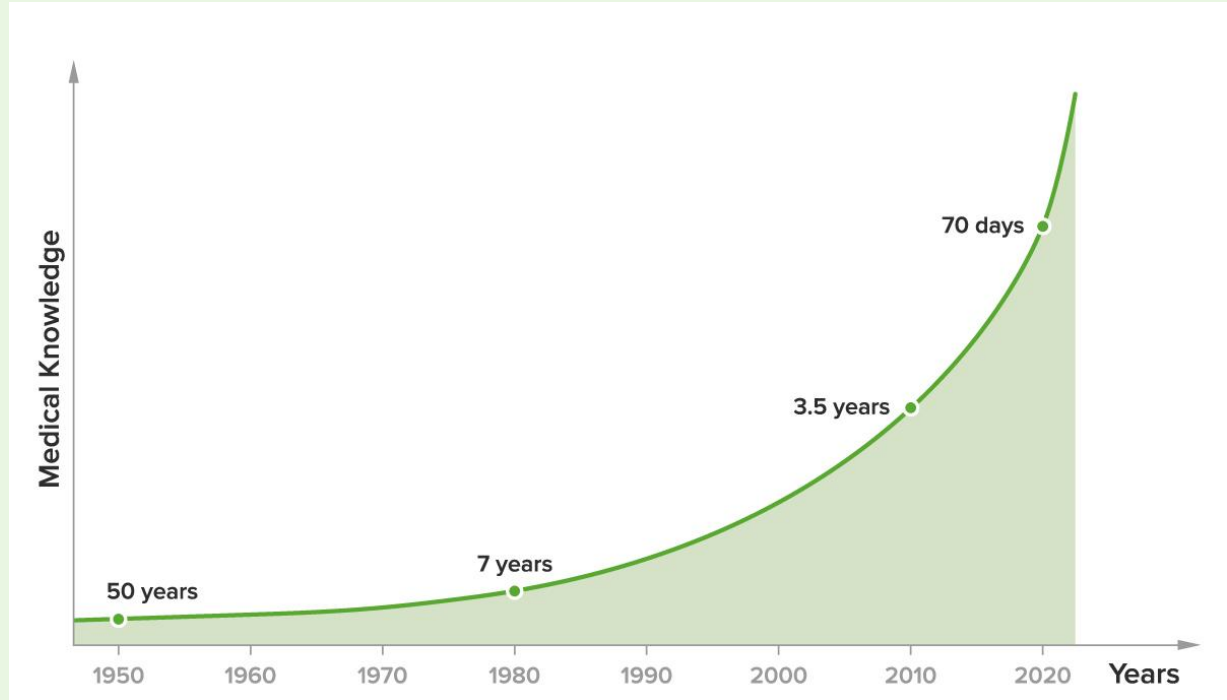
Hybrid Internet-based delivery **integrated** with local hands-on clinical training

Solution v2

Active learning **integrated** into the classroom

The Challenge

Medical knowledge doubles approximately every 70 days.



Densen P. Challenges and Opportunities Facing Medical Education. *Trans Am Clin Climatol Assoc.* 2011;122:48–58.

The Old Paradigm

Lecture

The diagram illustrates the 'Old Paradigm' of education. At the top, the title 'The Old Paradigm' is centered, with a horizontal line underneath it. Below the title, two black circles are positioned side-by-side. The left circle contains the word 'Lecture' and the right circle contains the word 'Study'. A double-headed horizontal arrow connects the two circles, indicating a reciprocal relationship. Below each circle is a light gray rounded rectangular box. The left box is titled 'In Class' and describes a traditional lecture where the professor is the source of information. The right box is titled 'Outside of Class' and describes students using their own study skills to learn and retain material, with no remediation provided.


Study

In Class

Traditional lecture.
Professor is the source of
information and knowledge.

Outside of Class

Students use whatever study skills
they have to learn and retain
material. No remediation.



EVIDENCE-BASED MEDICAL EDUCATION (EBME)

- 1 Rooted in defensible theoretical framework
- 2 Consistent with research findings
- 3 Design based on desired outcomes
- 4 Leverages use of technology to facilitate learning
- 5 Validated with successive implementations

The **New** Paradigm: EBME



Outside of Class

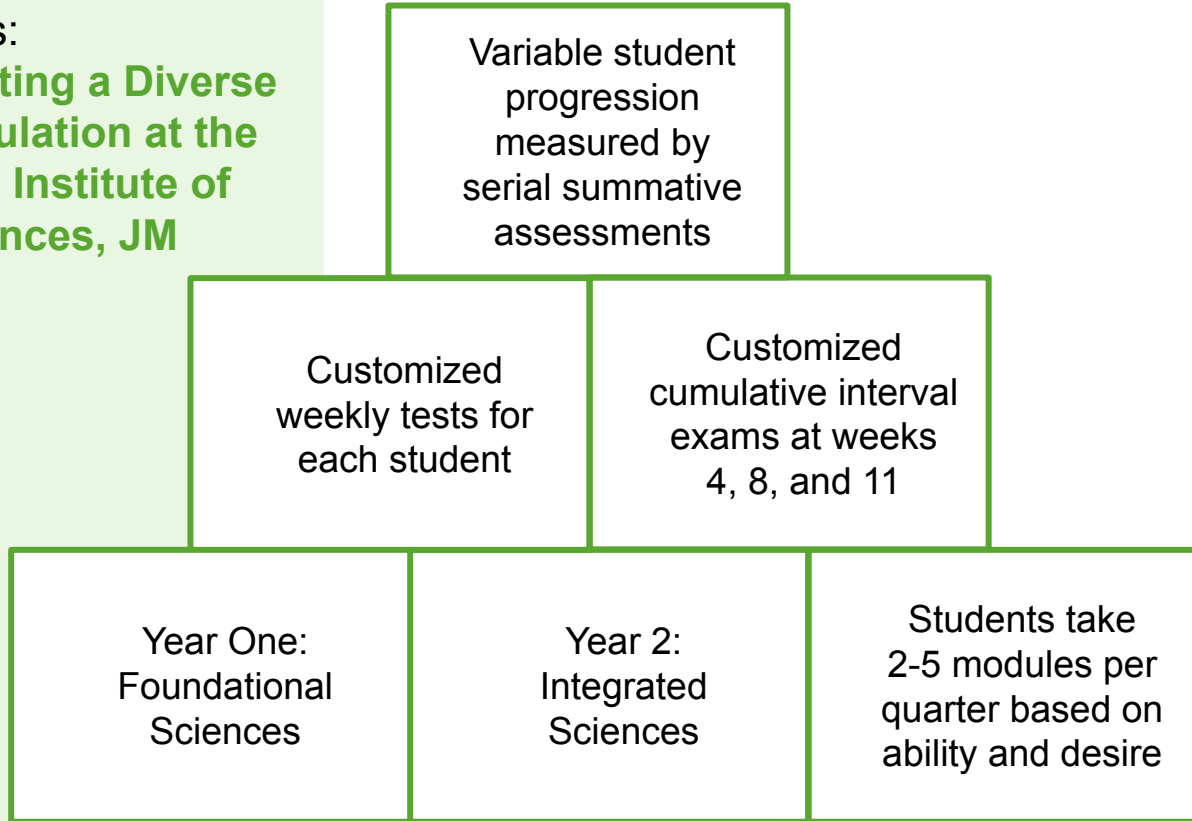
Students encounter new information and are steered to study skills supported by evidence.

In Class

Students actively practice skills and create knowledge together.

Using **Cognitive Science** and **Platform Capabilities** to Supply a Medical School's Requirements:

Accommodating a Diverse Student Population at the All American Institute of Medical Sciences, JM





ADMINISTRATION

Dashboard

Statistics

Users & Groups

Individual Learner View

Library

Qbank

Simulations

Insights-Dashboard

Assignments

Library Management

Qbank Management

User Management

Patient Notes

Contact Users

Users & Groups Statistics

Aug 24, 2021 - Aug 24, 2022



Started Lessons

85,037

Answered Recall Questions

491,878

59 % correct

Answered Qbank Questions

105,157

57 % correct

Viewed Articles

747

Groups

Users

Name	Videos			Recall Questions		Articles	Qbank Questions	
	Started	Finished	Watched Minutes	Answered	% correct	Viewed	Answered	% correct
Admin	132	28	298	191	59 %	19	9	11 %
Applied Biochemistry	2,262	2,107	13,879	14,998	58 %	0	604	56 %
Behav Medicine	12,604	11,456	81,948	81,017	60 %	174	14,996	59 %
Calculus & Statistics	5,336	4,887	32,473	34,129	65 %	11	511	53 %
Cell and Molecular Biology	1,501	1,416	10,057	13,854	51 %	0	32	38 %
Clerkships	32,300	30,065	201,243	206,371	57 %	116	61,550	59 %
Clerkships Faculty	134	67	574	382	71 %	6	86	26 %
College Maths	1,117	1,033	7,206	11,438	50 %	0	20	35 %
College Physics I	608	580	3,697	5,170	64 %	0	18	39 %



Overview

Performance by Course

Performance by User

Filter by:

Date Range

Last 12 Months

Group

ALL

User

ALL

Library/Curriculum

ALL

Topics

ALL

Subtopics

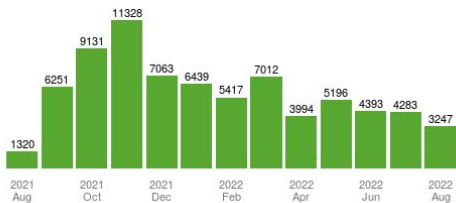
ALL

Qbank Question Topics

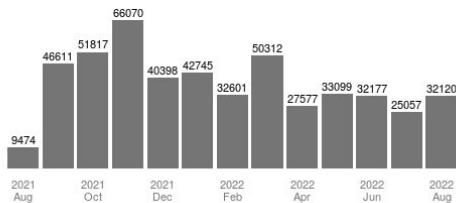
ALL

Total Activity [switch to average activity per user](#)

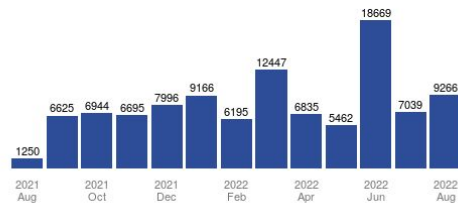
Total Lectures Watched



Total Recall Questions Answered

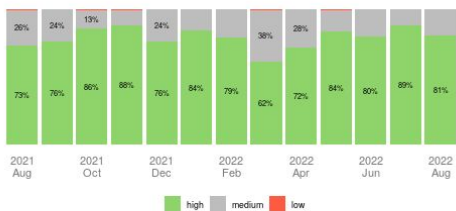


Total Qbank Questions Answered

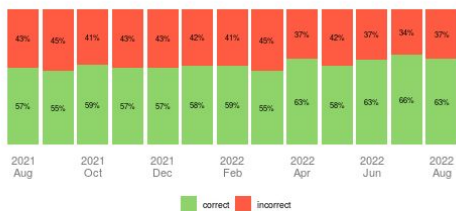


Overall Question Confidence and Performance

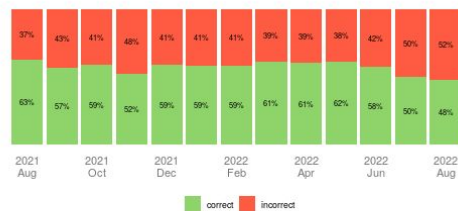
Overall Recall Question Confidence



Overall Recall Question Performance



Overall Qbank Question Performance





ADMINISTRATION

Dashboard

Statistics

• Users & Groups

• Individual Learner View

• Library

• Qbank

• Simulations

• Insights-Dashboard

Assignments

Library Management

• Course Creator

• Additional Lecturio Content

• Library Manager

• Curricula Visibility

Learning Paths Creator

Learning Paths / AAIMS Foundation Basic Science Courses

Anatomy I: Thorax, Abdomen & Pelvis		View	
Cells & Tissues		View	
Epidemiology and Fundamentals of Research Study Design		View	
Biochemistry		View	
Anatomy III: Head, Neck & Back		View	
Microbiology		View	
Introduction to Pathology		View	
Introduction to Physiology		View	
Medical Ethics and Leadership		View	
Health Systems Science		View	
Cell & Molecular Biology		View	
Anatomy (incl. Developmental) - Upper Limb/Lower Limb		View	
POM - Medical Ethics/Physician as Leader		View	

Eng



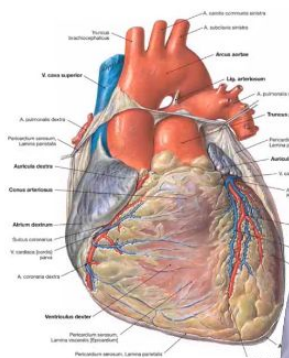
Chambers and great vessels
Chambers

Atria – upper chambers

- Right atrium
- Left atrium
- Auricles

Ventricles – lower chambers

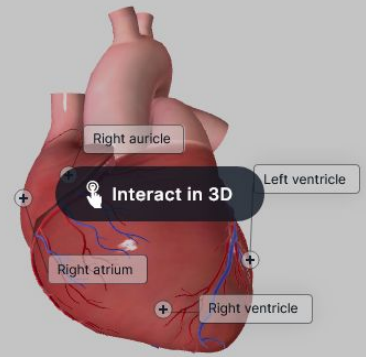
- Right ventricle
- Left ventricle



The chambers and great vessels
Dr. Craig Canby

0:05 / -7:08

3D Model



Playlist
25 videos

- ▶ Chambers and Great Vessels – Heart (Cor)
- ▶ Surface Anatomy of the Heart – Heart (Cor)

SHOW PLAYLIST

Chambers and Great Vessels – Heart (Cor) by Craig Canby, PhD

ASSIGN

- Bookmark
- 3D Model
- Transcript
- Objectives
- Materials
- Notes
- Report



Unanswered
3

Due Today
0

Learned
0

AUTO TRANSLATION

Which statement is correct?

- The inferior vena cava empties into the left atrium.

- The superior vena cava empties into the right atrium.

- The pulmonary vein originates from the left atrium.

- Pulmonary veins empty into the right atrium.

- The superior vena cava empties into the left atrium.





- Home
- Study Planner
- Videos
- Concept Pages
- Question Bank
- Learning Paths
- Simulations (Beta)
- External tools
- Spaced Repetition**
- Bookmarks
- Notes
- Performance
- Patient Notes
- COVID-19 Resources
- Administration
- Help Center

Spaced Repetition

Selected Deck

Pre-Clinical / USMLE Step 1

Selected Filter

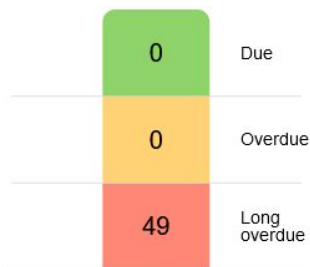
By Subject

Total Due (i)

Number of total due questions

Questions for today

49



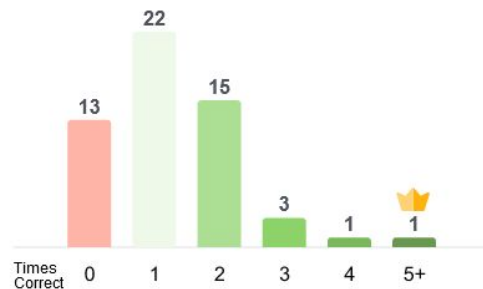
ANSWER DUE QUESTIONS

Mastery Level

Questions by times answered correctly in a row

Total Deck Size

55



Aging

0 / 1 learned

0% learned >



Anatomy

6 / 20 learned

30% learned >



Biochemistry

0 / 3 learned

0% learned >



Embryology

0 / 5 learned

0% learned >

Create a summary note



Write down all the key points that you can remember from this lesson.

Your Summary Note

Begin typing your summary note to save, otherwise skip.



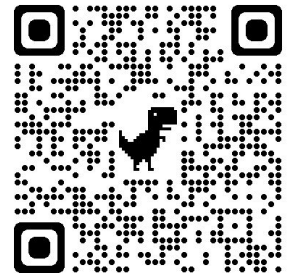
Creating and retrieving summary notes helps with your long term mastery of concepts. Click [here](#) to find out more about learning science and further settings.

SKIP

Small Group Knowledge Creation

Please move into small
groups for discussion and
knowledge creation

You will need: pen/paper
or a computer, tablet, or
phone to write on, or
collaborate in Padlet





PLATFORM INTEGRATION WORKSHOP



Think about your favorite—or least favorite—subject to teach.



Or, choose the subject that your students struggle with the most.



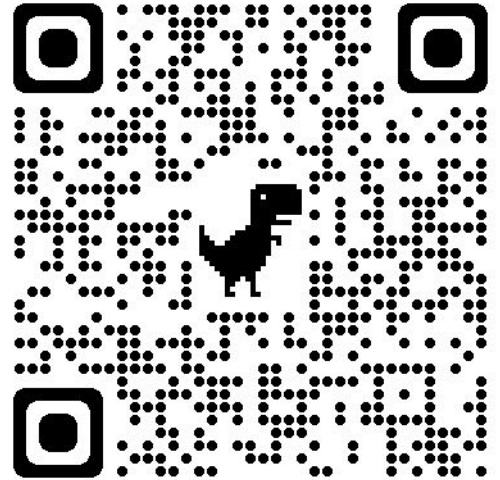
In this workshop, we will ask you to consider ways to integrate the technological capabilities of platforms to enhance that subject.

Workshop your flipped classroom & record your answers

- How is **information shared** with students currently for this subject? (Readings, lecture, video, etc. What are ways that platform could support sharing this information?
- What is the student's role and **level of engagement** in this subject? How could platform integration increase engagement?
- What is the teacher's current role in this lesson? (Lecturer, expert, etc.) What could be an alternate **potential role**? (Coach, guide, mentor, etc.) How might platform integration facilitate these potential roles?
- For your class, how could platform integration help knowledge be practiced or **created actively, experientially, collaboratively, or communally**?
- What would your ideal learning platform allow you to do **before, during, and after** class?
- What **obstacles** do you anticipate with a platform? How could you **overcome** th ^

Wrap-Up Discussion

Bring your notes back to the large group for discussion and collaboration in Padlet.



Share and/or record your answers

- Two ideas from this workshop that resonated with me:
- One idea from this workshop I'm struggling to accept:
- One idea from this workshop I could implement right away:
- What type of content would lend itself to this implementation and integration?
- What types of learning objectives could this implementation and integration support for my students?
- What are the learner's needs in my school or classroom?
- How could this implementation and integration help support those learners?

Thank You!

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Modular Mastery-Based Curriculum at AAIMS

Year One (MS-1)				Year Two (MS-2)			
11 Weeks per Quarter				11 Weeks per Quarter			
Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 5	Quarter 6	Quarter 7	Quarter 8
Anatomy (incl. Developmental) - Thorax and Abdomen	Anatomy (incl. Developmental) - Upper Limb/ Lower Limb	Anatomy (incl. Developmental) - Head/Back/Neuro	Intro to Pathology	HBD - Integrated CVS	HBD - Integrated Endocrine	HBD - Integrated Reproductive - Male and Female	HBD - Integrated Hematology-Oncology-Immunology
Cells and Tissues - Micro Anatomy	Epidemiology - Biostats	Immunology - Hematology	Intro to Physiology	HBD - Integrated Respiratory	HBD - Integrated GI	HBD - Renal	HBD - Integrated Neurosciences
Applied Biochemistry	Molecular Medicine/Genetics	Microbiology	Intro to Pharmacology	Health Systems Science	Nutrition I&II	HBD - Integrated Musculoskeletal/ Skin	Behavioral Medicine
POM - Medical Ethics/Physician as Leader	POM - Research Study Design- Research Project	Complementary Medicine*	Patient Communication Skills - H&P	POM - Clinical Correlates to Ongoing Courses - PBL	POM - Clinical Correlates to Ongoing Courses - PBL	POM - Clinical Correlates to Ongoing Courses - PBL	POM - Clinical Correlates to Ongoing Courses - PBL

Final Grade of 80 or greater: Honors. | Final Grade between 60-79: Credit/Pass. | Final Grade between 0-59: No Credit (Course must be repeated)

There will be no Re-Sits. Standard academic progression is for students to take and pass 4 blocks/quarter

(but can elect to take a heavier courseload if approved by their advisor and may be asked to reduce courseload if indicated).

The first 16 blocks are mandatory prerequisites for the second 16 blocks except Comp. Med.* which can be taken in either year


DISCUSSION 1:

Should content drive the use of technology,

or should technology drive the choice of content?

What is the primary role of technology in the classroom?

Remember: Learning objectives stay the same no matter what technology is (or is not) used.



EVIDENCE-BASED MEDICAL EDUCATION (EBME)

1

Understand how the brain learns

2

Test evidence-based learning strategies

3

Apply and refine effective strategies

4

Leverage technology to maximize learning

DISCUSSION 2:

What kind of teaching and learning strategies does the **evidence** and **research** support?

How might platform integration **make those strategies happen** in my classroom?

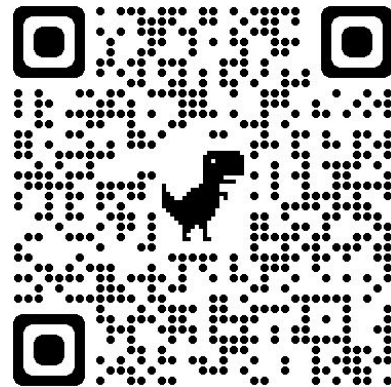
What other potential benefits might **platform integration** have?

Tip: Expect to feel resistance to change. Use this opportunity to clearly identify obstacles.



Share and/or record your answers

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- One idea from this workshop I could implement right away:
- What type of content would lend itself to this implementation and integration?
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Discuss with your group & record your answers

- How is **information shared** with students currently for this lesson? (Readings, lecture, video, etc.)
- What are other ways that platforms could support sharing this information?
- What is the student's role and **level of engagement** in this lesson?
- What is the teacher's current role in this lesson? (Lecturer, expert, etc.)
- What could be an alternate **potential role**? (Coach, guide, mentor, etc.)
- How might platform integration facilitate these potential roles?
- How is **knowledge created** and practiced by students currently for this lesson? (Schema, skills, practice, behavior, individually, collaboratively, etc.)
- How could platform integration help knowledge be practiced or **created actively, experientially, collaboratively, or communally**?

Wrap-Up Discussion

Bring your notes back to the large group for discussion.

Educators: Lead the process of integrating technology

- Software platforms are best developed and managed by businesses who partner with faculty and institutions
- Find a software platform you like and work with them
- Give your students the tools they need to learn effectively
- Use technology to improve the effectiveness and availability of medical education
- Help shape how technology is used in your institution and beyond

Workshop Goals

1. Share knowledge and experience with hybrid (aka. flipped learning) and platform-based content delivery (30 minutes)
2. Form small groups to curate and create flipped/hybrid lesson with **solutions for platform integration** (30 minutes)
3. Reflect on and share advantages and challenges to platform integration based on hybrid learning experience (30 minutes)

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