

TRANSITIONING DIDACTIC DELIVERY INTO A DYNAMIC EDUCATIONAL EXPERIENCE: A PRACTICAL GUIDE

Andrew P. Binks, Ph.D abinks@vt.edu

Renee J. LeClair, Ph.D rleclair@vt.edu

Riverside | Suite 202

GOAL

Illustrate and **apply** a 5-step method for transitioning any didactic content into a more effective student-centered delivery format.



UNDERGROUND



reality

Why?

- Connect content, objectives and assessment
- Written learning objectives

Connect content

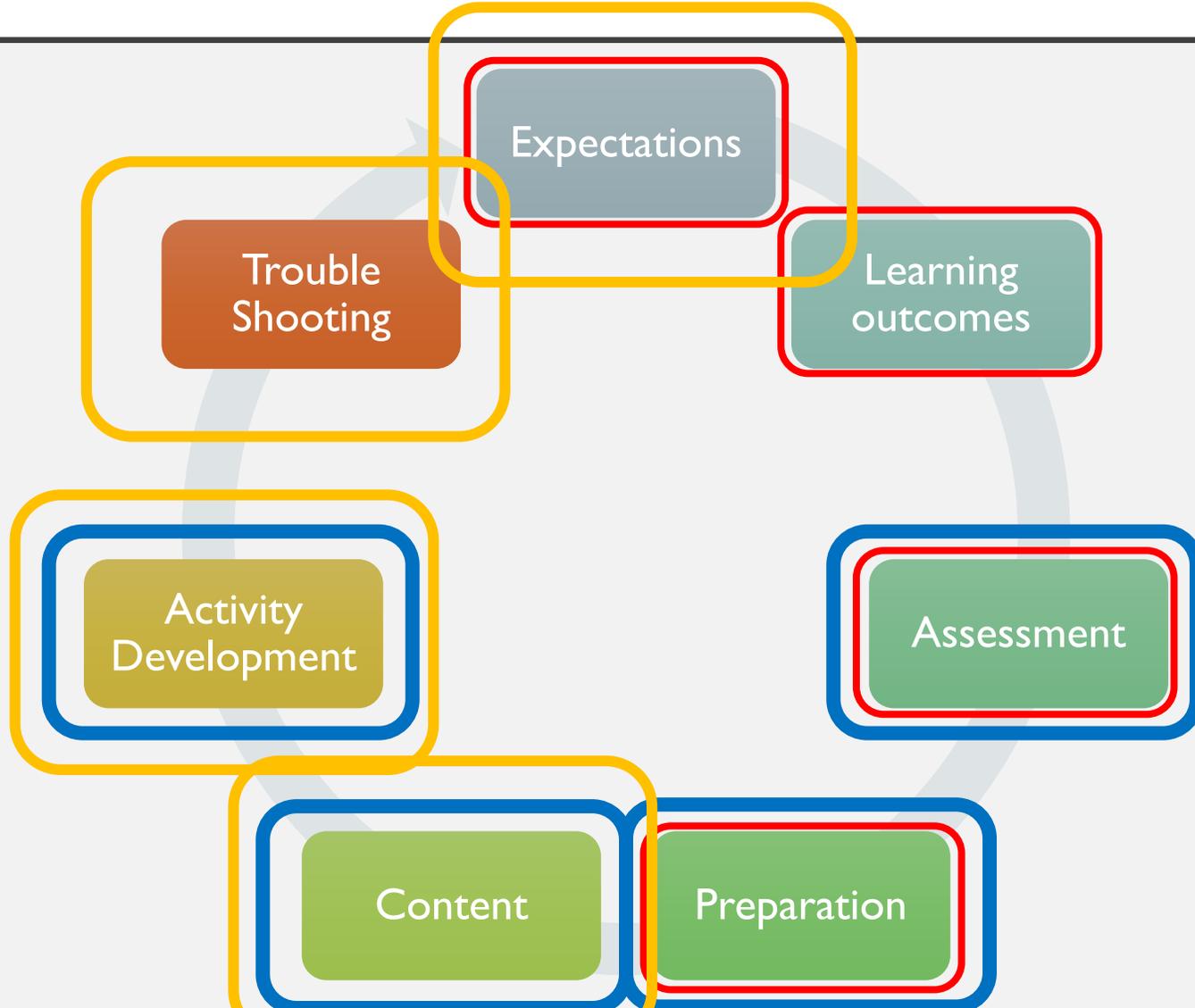
- Develop resources
- Connect content, objectives and assessment

Apply basics

- Develop an in class activity
- Connect content, objectives and assessment

Describe a clear method for development of an effective student centered activity from any didactic content.

WHAT IS THIS 'PROCESS'?
(DESCRIBE A CLEAR METHOD FOR DEVELOPMENT OF AN EFFECTIVE STUDENT CENTERED ACTIVITY FROM ANY DIDACTIC CONTENT.)



SESSION 3

- Apply the principles of the 5 S's to generate a student-centered activity. (from Session 2)
- Apply fundamentals of learning theory to empower both the faculty and the student to achieve higher level learning in the classroom setting.
- Effectively link assessments with learning outcomes and dynamic delivery to ensure student success.
- Discover the importance of content integration for application, long-term retention and optimal use of classroom time.

ASSUMPTIONS (RESPONSIBILITIES)

Learner

Knows how to use the resources provided for learning

Prepares requested materials (can find materials and has appropriate time)

Must be brave

Brings something to the group that is unique

Must be brave

Facilitator

Develop applied learning outcomes (target assessment)

Identify student preparation materials

Align content, activity and assessment.

Create a safe learning environment –
Generate a learning task

Evaluate through an appropriate assessment

Compare the emphasis and importance of the roles of educator and student in the didactic and dynamic classrooms

ACTIVITIES AND SCHEDULES:

Create a safe learning environment and learning task

- This is foundational and will threaded through the series.

Part 1: Develop an activity

- *Using the '5 S' format, generate an activity that could be used to deliver content in a dynamic manner. Be sure to address each element.*

Part 2: Evaluate through an appropriate assessment

- *Review the session assessment.*
- Align the summary of the activity to address key take home elements
- Review the learning objectives to ensure alignment at the level of the learning.
- Are the assessment and learning objectives asking the learner to achieve the same level on Bloom's Taxonomy? (evaluate, utilize, analyze)

CLINICAL CORRELATION

Dyslipidemia

Familial
hyperlipidemia

Abetalipoproteinemia

ABCA1 transporter
deficiency

Cholesterol
flux

VLDL and
LDL
maturation

Dietary
lipids

Fat soluble
vitamins

Chylomicro
n synthesis

Reverse
Cholesterol
transport

CETP

ApoCII
delivery

Apply fundamentals of learning theory to empower both the faculty and the student to achieve higher level learning in the classroom setting.

LESSONS FROM TEAM-BASED LEARNING

Significant problem

- Ask students to meaningfully apply concepts they are learning

Same problem

- Groups work on the same puzzle

Specific choices

- Give groups specific choices rather than open ended questions

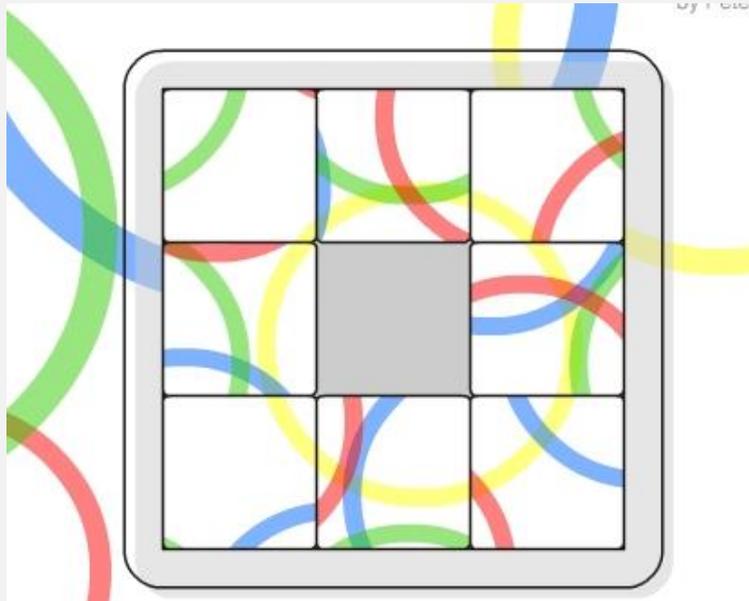
Simultaneous reporting

- Groups report all at the same time

Summarize outcomes

- Be clear on the outcomes and conclusions of your activity

DYNAMIC ACTIVITIES



Create assessments to evaluate basic knowledge and higher level learning (e.g. STEP I type question or EPA).
Discover the importance of content integration for application, long-term retention and optimal use of classroom time.

MINI MAP CONCEPTS

	<u>Exogenous Pathways</u>	<u>Common concepts</u>	<u>Endogenous Pathways</u>
Significant problem		ApoCII • Ask students to meaningfully apply concepts they are learning	LDL HDL ApoB100
Same problem		• Groups work on the same mini map	ApoA LDL receptor HMGCoA Reductase
Specific choices		• Give groups specific choices rather than open ended questions	CETP LCAT/ACAT Hepatic lipase

Are there any concepts you want to discuss?

Are there any concepts you are having difficulty connecting?

PROMPT:

Using a concept map illustrate potential mechanisms leading to elevated serum cholesterol. Your map should also include the following:

1. Origin of: chylomicrons, HDLs, LDLs, VLDLs,
2. Transport of de novo TAGs and cholesterol from the liver to peripheral tissues
3. Transport of dietary TAGs and cholesterol from the intestine to peripheral tissues
4. Transport of cholesterol from peripheral tissues to the liver
5. Interaction of HDL with chylomicrons and VLDLs
6. Regulation of cholesterol synthesis

Specific choices

- Give groups specific choices rather than open ended questions

MAPPING GUIDE

Lipoprotein	Origin	Primary Apo protein	Composition	Primary role
HDL (most dense)	Liver	ApoA	C and CE > TG	Reverse cholesterol transport
LDL	Maturation of VLDL	ApoB100	C and CE > TG	Cholesterol transport from the liver
VLDL	Liver	ApoB100	TG > C and CE	Carry newly synthesized TG from the liver to the adipose
Chylomicron	intestine	ApoB48	TG >> C and CE	Carries dietary fat and cholesterol from the intestine to the peripheral tissues for storage

MINI MAPPING

Significant problem

- Ask students to meaningfully apply concepts they are learning

Same problem

- Groups work on the same map

Specific choices

- Give groups specific choices rather than open ended questions

Simultaneous reporting

- You can use digital projections of maps or a museum walk

Summarize outcomes

- Mapping Guide

CLINICAL PUZZLE

- The presentations below can be attributed to defects in lipoprotein metabolism. Review each of the scenarios and match these presentations to the corresponding lipid panel and diagnosis. You will only use each lipid panel and diagnosis once. Consider diagnostics, time of presentation and history of the presentation.

Significant problem

- Ask students to meaningfully apply concepts they are learning

Same problem

- Groups work on the same puzzle

Scenario 1

A 28-year-old male presents to his primary care physician for a follow-up. As part of a routine wellness effort by his company he recently participated in a review of health systems that evaluated: lipid levels, blood pressure, BMI. He had just received the results wanted to continue with a follow up. He has a family history of cardiovascular disease. Upon physical exam he appears in good health and blood pressure is 145/90, urinalysis is normal and kidney function is intact.

Scenario 2

A 49-year-old male presents to the emergency department with episodes of stabbing gastric discomfort. Upon physical exam he has peripheral muscle weakness and tendon reflexes were absent; xanthomas were presented on both hands. Abdominal exam was positive for mild splenomegaly. Sonography showed stenosis of the carotid artery and left ventricular hypertrophy with reduced left ventricular function on echocardiography. Laboratory values showed undetectable serum HDL. Previous to this, he had a tonsillectomy at age 14. Otherwise, family history was unremarkable.

Scenario 3

A 28-year-old male presents to his primary care physician for a follow-up. As part of a routine wellness effort by his company he recently participated in a review of health systems that evaluated: lipid levels, blood pressure, BMI. He had just received the results wanted to continue with a follow up. He has a family history of cardiovascular disease. Upon physical exam he appears in good health and blood pressure is 145/90, urinalysis is normal and kidney function is intact.

Scenario 1

A 12-year old female presents to her primary care physician due to progressively worsening symptoms.

Scenario 2

A 49-year-old male presents to the emergency department with episodes of stabbing gastric discomfort.

Scenario 3

A 28- year-old male presents to his primary care physician for a follow-up.

Lipid panels (mg/dL)

Panel C

Plasma TAG 178

Total cholesterol 59

Lipid panels (mg/dL)

Panel A

Plasma TAG 148

Total cholesterol 249

Lipid panels (mg/dL)

Panel B

Plasma TAG 24.5

Total cholesterol 5

Diagnosis

Lipoprotein Lipase (LPL) deficiency

Diagnosis

LDL Receptor deficiency

Diagnosis

Abetalipoproteinemia (MTP deficiency)

Diagnosis

ABCA1 transporter deficiency

Specific

- Give groups specific choices rather than open ended questions

CLINICAL PUZZLE

Significant problem

- Ask students to meaningfully apply concepts they are learning

Same problem

- Groups work on the same puzzle

Specific choices

- Give groups specific choices rather than open ended questions

Simultaneous reporting

- You can use laminated cards to report in the classroom

Summarize outcomes

- Group discussion in class; manage time; summarize discussion!

WORK WITHIN YOUR GROUPS:

- Generation of a dynamic learning activity that reinforces student preparation materials and enhances student learning through application.
- Evaluation through appropriate assessment.
- Perhaps you modify to include assessment of other competency domains?

IDEAS AND QUESTIONS

CROSS-DISCIPLINARY APPLICATIONS

Cholesterol synthesis

Fatty acid synthesis

Digestion of fats

Distribution of triacylglycerols

Hormonal influences on tissue

Reverse cholesterol transport

Myocardial infarction

Acute coronary syndromes

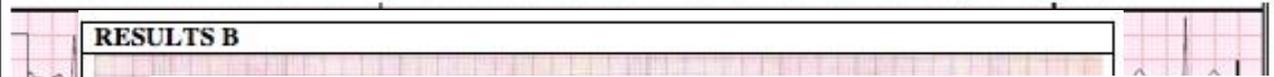
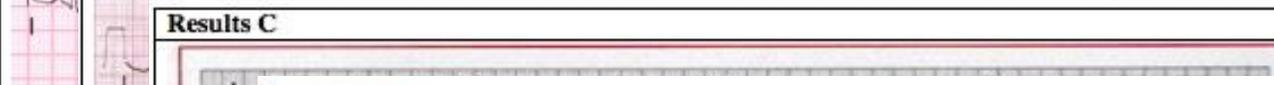
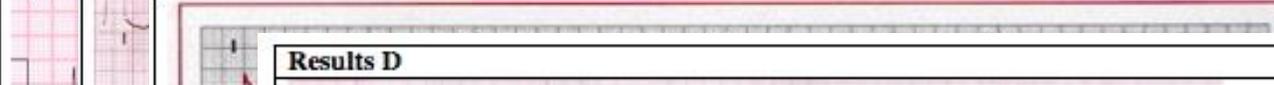
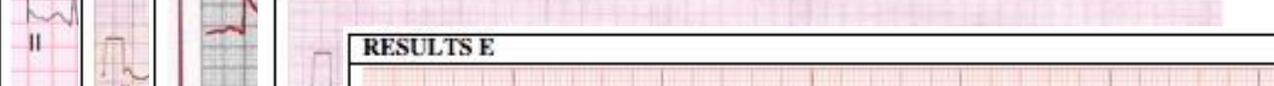
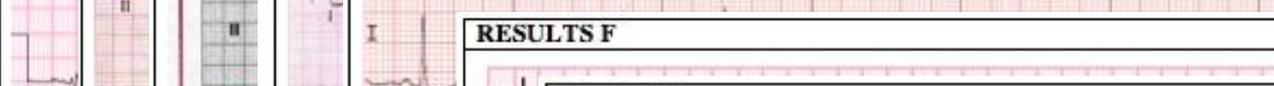
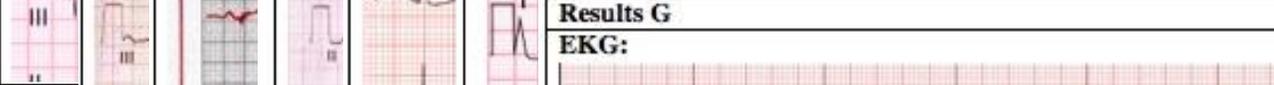
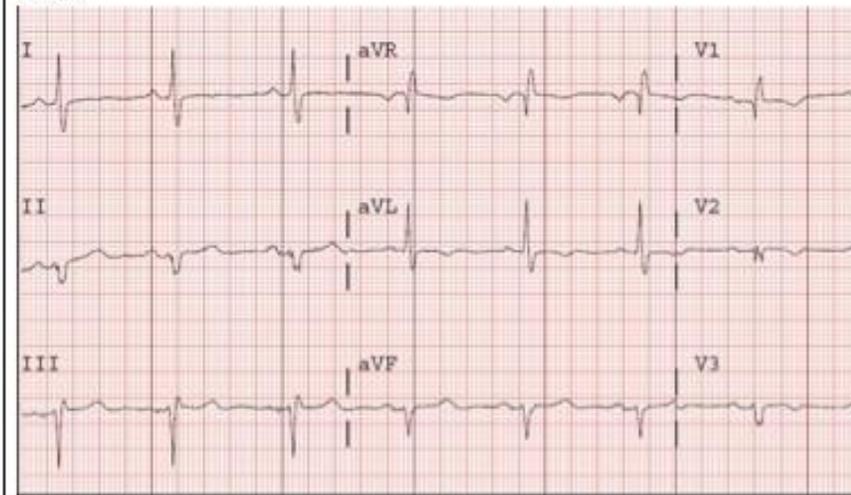
Lipid panel

Cardiac enzymes

Depolarization vectors

ECG

Discover the importance of content integration for application, long-term retention and optimal use of classroom time.

Results A**EKG:****RESULTS B****Results C****Results D****RESULTS E****RESULTS F****Results G****EKG:**

Enzym
cTnT =
cTnI =
CK-MB =
LDH =
Myogl =

Lipids
Total C
HDL =
LDL =
Triglyc

Enzy
cTnT =
cTnI =
CK-MB =
LDH =
Myogl =

Lipid
Total
HDL
LDL
Trigl

Enzy
cTnT =
cTnI =
CK-MB =
LDH =
Myogl =

Lipids:
Total Ch
HDL =
LDL =
Triglyce

Enzym
cTnT =
CK (MB
LDH =
Myoglo

Lipid:
Total Ch
HDL =
LDL =
Triglyce

Enzy
cTnT =
cTnI =
CK -
LDH =
Myog

Lipid:
Total Ch
HDL =
LDL =
Trigly

Enzymes (expressed as multiples of 99th percentile):

cTnT = Normal

cTnI = Normal

CK (MB) = Normal

Myoglobin = Normal

LDH = Normal

Lipids:

Total Cholesterol = 229

HDL = 45

LDL = 142

Triglycerides = 210

Case 1: A 58 y.o. man is brought to the E.D. by his wife after experiencing mild chest pain while performing yard work. The chest pain resolved after 10min during the drive to the hospital. The man has a significant history of untreated hypertension, type II diabetes and is a 40 pack-year smoker.

B.P. = 155/95

SaO₂ = 96% (resting, room air)

Final Diagnosis: Stable Angina

Case 2: A 73 y.o. woman with history of CAD (CABG x 2), hypertension, hyperlipidemia and known previous LAD occlusion, presented to the ED with chest pain, substernal and left-sided but radiating to the right shoulder. It has been intermittent, occurs at rest and has not responded to nitroglycerin.

B.P. = 135/90

SaO₂ = 98% (resting, 2 l/min O₂)

Final Diagnosis: Unstable Angina

Case 3: A 57 y.o. woman with a one week history of exertional angina presents to the E.D. after a sudden onset of nausea, diaphoresis and dyspnea while vacuuming. There were no inciting events, but she did forget to take her atenolol that morning.

BP = 160/100

SaO₂ = 98% (resting, 2 l/min O₂)

Final Diagnosis: Unstable Angina

Case 4: A 63 y.o. man presents after intermittent chest pain over the prior two days that initially started as a sensation of heartburn. The pain has increased in the last four hours and he is now experiencing shortness of breath. He is taking metformin for Type II diabetes, lipid lowering therapy and low dose aspirin.

B.P. = 135/90

SaO₂ = 98% (resting, 2 l/min O₂)

Final Diagnosis: NSTEMI associated with LAD stenosis

Case 5: A 28 y.o. man arrives in the E.D. after experiencing severe sub-sternal pain while nearing completion of a half marathon. Onset of pain was 30 minutes prior to arrival. He has no other significant medical history. He denies use of illicit drugs, does not smoke and drinks 3-4 beers per week.

BP = 110/70

SaO₂ = 98% (resting, 2 l/min O₂)

Final Diagnosis: High Lateral STEMI

Case 6: A 62 y.o. woman is recovering in the ICU after abdominal surgery performed 24 hours earlier. Pain management includes I.V. fentanyl. Her blood pressure begins to fall and a vigilant nurse notices changes to her EKG. The patient begins to vomit and is diaphoretic.

BP = 90/65

SaO₂ = 98% (resting, room air)

Final Diagnosis: STEMI

TROUBLE SHOOTING (DISSECTING OUT THE COMMENTS)

“I can’t do this activity without a lecture first.”

Preparation is key; focused materials lead to a positive outcome

“These activities take too long and I can’t give up the

Timing is critical. Keep the activity short so students get bored. Focus on content!

Get feedback along the way!
Planning, Implementation, Follow up.

“The idea was confusing and we didn’t know what to do.”

Rethink the activity. Did you miss a critical step in planning?

“Everyone left confused”

Summarization is essential.

“I don’t like to work in teams”

Divide the class ahead of time, recognize the teamwork takes practice!

WORKSHOP SUMMARY

Significant problem

- Transitioning didactic to active learning is challenging!

Same problem

- All groups worked on objectives OR an activity

Specific choices

- The tasks were specific

Simultaneous reporting

- Groups report all at the same time; some asynchrony here but this can be OK.

Summarize outcomes

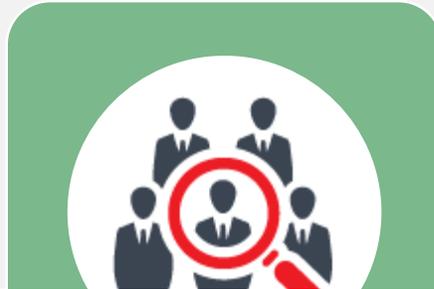
- Great discussion around the topics!

Session 1: Underground	GOAL: Review the <u>assessment</u> and <u>learning objectives</u> you currently have for any session. <ul style="list-style-type: none">a. Reflect on the assessment used to address student learning.b. Generate learning objectives directed to assessment
Compare the emphasis and importance of the roles of educator	Embrace changing medical education and adapt your role within the classroom.
Align objectives, content, activity and assessment.	Appreciate the consequences of poorly aligned preparation materials, learning objectives, activity and assessment. <ul style="list-style-type: none">a. <u>Reflect on how these misalignments negatively impact the learning environment.</u>
Develop applied learning objectives (target assessment)	Develop <u>applied learning objectives</u> that are aligned to the <u>assessment</u> . <ul style="list-style-type: none">a. Think of what you want the student to ‘do’

<p>Session 2: Transition to reality</p>	<p>GOAL: Review/Generate preparation materials that are appropriate for student use</p> <ul style="list-style-type: none"> a. Develop a resource that is reflective of content you need the learner to know when they enter the classroom b. Ensure alignment of the resource to the activity and assessment
<p>Develop student preparation materials</p>	<p>Determine what the students <u>must be able to</u> ‘know, list, describe’ before engaging in the activity. (What are the lower level learning objectives?)</p> <ul style="list-style-type: none"> a. Identify <u>concise preparation</u> materials that are realistic for a student to review b. May require tailoring of previously used content <p>Generation of a self-learning module (SML)</p>
<p>Define concepts based on learning objectives, preparation materials and assessment</p>	<p>Determine the <u>key concepts</u> you want to deliver during the session.</p> <ul style="list-style-type: none"> a. Create a list of key terms, elements, concepts you plan to address. Link the concepts to a <u>clinically (or otherwise) relevant paradigm</u>. a. If you are struggling to link concepts, rethink your content. b. Review national standards for the discipline. c. Review course level objectives
<p>Review or develop assessment</p>	<p><u>Review the (or develop the) assessment</u> for the session.</p> <ul style="list-style-type: none"> a. Will the activity (preparation materials and objectives) adequately prepare the learner for the planned assessment?
<p>Introduce the 5’s of active learning</p>	<p>Appreciate the importance of the 5 S’s (significant, same, specific, simultaneous and summarize) in creating classroom experience</p>

Session 3: Reality	GOAL: Development of an inclass activity using well aligned materials.
Create a safe learning environment and learning task	<p><u>This is foundational</u> and will threaded through the series.</p> <ol style="list-style-type: none"> Is your environment open to questions? Are you confident in saying ‘I don’t know!’ Recognize that group work is hard
Develop an activity	<p>Using the ‘5 S’ format, generate an activity that could be used to deliver content in a dynamic manner. <u>Significant problem</u>: Ask students to meaningfully apply concepts they are learning</p> <ul style="list-style-type: none"> <u>Same problem</u>: Group/individuals work on the same puzzle <u>Specific choice</u>: Give groups/individuals specific choices rather than open ended questions <u>Simultaneous reporting</u>: Groups/individuals report all at the same time <u>Summarize outcomes</u>: Be clear on the outcomes and conclusions of your activity
Evaluate through an appropriate assessment	<p>Review the session assessment.</p> <ol style="list-style-type: none"> <u>Align the summary</u> of the activity to address key take home elements Review the learning objectives to ensure alignment at the level of the learning. Are the <u>assessment</u> and <u>learning objectives</u> asking the learner to achieve the same level on Bloom’s Taxonomy? (evaluate, utilize, analyze)

WHAT ARE OUR ROLES AS MEDICAL EDUCATORS?



Living Systems: **Applies knowledge** and skill in the natural sciences **to solve problems** related to molecular and macro systems including biomolecules, molecules, cells, and organs.

Human Behavior: **Applies knowledge** of the self, others, and social systems **to solve problems** related to the psychological, socio-cultural, and biological factors that influence health and well-being.

- Teamwork
- Oral Communication

- Resilience and adaptability
- Capacity for improvement

- Quantitative reasoning
- Scientific inquiry
- Written communication

- Human behavior

Compare the emphasis and importance of the roles of educator and student in the didactic and dynamic classrooms

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