Lecturio

# Assessments:
# New Uses for an Old Tool

November 2, 2022
Online Seminar

# Learning Objectives:

1. **Plan** assessments to support and measure learning.
2. **Align** assessments with objectives and content.
3. **Incorporate** best practices in creating and delivering assessments.
4. **Review** assessments to ensure effectiveness.

# Assessments: Definition & Purpose

QUESTION

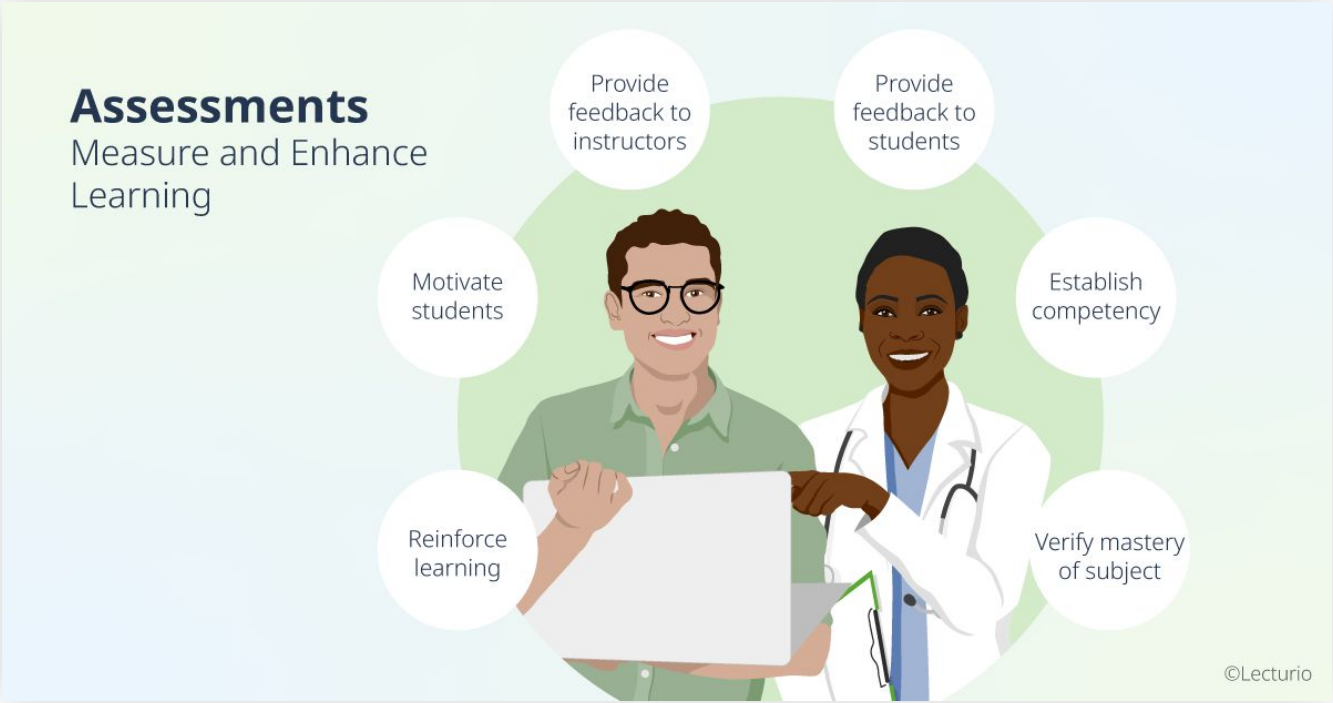
# How do you use assessments? List a few examples in the chat!

*Tell us in the chat!*

# Forms of Assessments

- Assessments include more than just evaluative exams.
- They can be a valuable learning tool!

# Purpose of Assessments



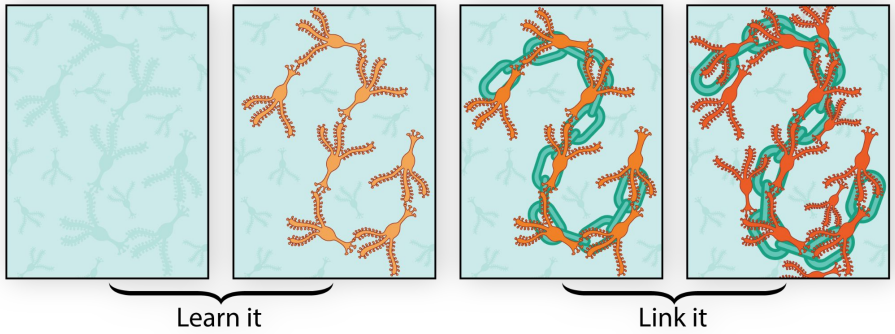

1. Harden RM, Laidlaw JM. Essential Skills for a Medical Teacher: An Introduction to Teaching and Learning in Medicine. Elsevier Health Sciences; 2016. 305 p.

# Cognitive Foundations

- Formative assessments can be used to scaffold skills and improve **metacognition**
- Incorporate **spacing** and **interleaving** to improve retention and comprehension
- **Feedback** corrects misconceptions, reinforces correct answers, and improves metacognition

# Insights from Neuroscience

- As information is retrieved, neural pathways are strengthened by changes in several cellular processes.
- Spacing of retrieval events allows for consolidation of neural pathways.
- Retrieval with feedback helps establish effective neural cross linkages.



# Test-Enhanced Learning (TEL)

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Test-enhanced learning is the idea that the efficacy of **remembering concepts** or facts is augmented by:

- **Retrieving** concepts/facts from the memory.
- Increasing long-term **retention** of those concepts/facts.

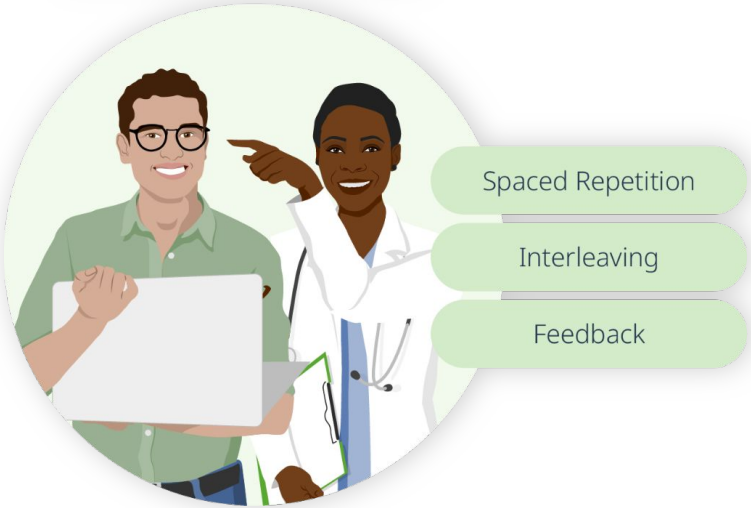
# TEL Benefits

1. Effective across **various learners** and **assessment types** (1)**.**
2. Improve metacognition and the retention of knowledge.
3. Allows students to **reinforce** specific areas

1. Green ML, Moeller JJ, Spak JM. Test-enhanced learning in health professions education: A systematic review: BEME Guide No. 48. Med Teach [Internet]. 2018 Apr 3 [cited 2022 Sep 12];40(4):337–50. Available from: https://doi.org/10.1080/0142159X.2018.1430354

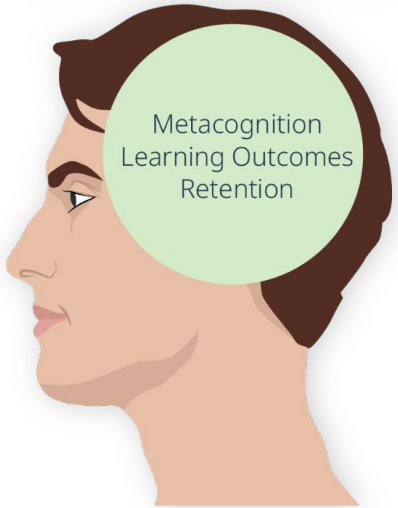
# Augmentation of Test-Enhanced Learning (TEL)

When assessments promote:



- Spaced Repetition
- Interleaving
- Feedback

We see improved results in:



Poll

1

One of the benefits of test-enhanced learning (TEL) is that it:

a. Is effective across various learners
b. Encourages memorization
c. Reduces metacognition

Poll

1

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# Practical Implementations of TEL

- Incorporate frequent quizzes to support **retrieval**
- Have students **generate** “summary points” during or after a class
- Explain the testing effect to increase student **metacognition**
- Keep it **low stakes**
- Emphasize the importance of your **learning objectives**

1. Brame CJ, Biel R. Test-Enhanced Learning: The Potential for Testing to Promote Greater Learning in Undergraduate Science Courses. Tanner K, editor. CBE—Life Sci Educ [Internet]. 2015 Jun [cited 2022 Sep 14];14(2):es4. Available from: https://www.lifescied.org/doi/10.1187/cbe.14-11-0208

# U-Behavior

A learning and teaching method that uses **platform-based delivery** and tracking of quizzes to promote optimal student study behaviors and practices.

# U-Behavior

Grading incentives reward **Spacing** and **Interleaving** leading to better long-term **retention** of the material!

1. McKenna K, Pouska B, Moraes MC, Folkestad JE. Visual-Form Learning Analytics: A Tool for Critical Reflection and Feedback. Contemp Educ Technol [Internet]. 2019 Jul 12 [cited 2022 Feb 16];10(3):214–28. Available from: https://www.cedtech.net/article/visual-form-learning-analytics-a-tool-for-critical-reflection-and-feedback-6244

# The AAIMS Model

- The mid-term and final exams were converted into 3 interval cumulative tests per 11-week term
- 10 Friday afternoon non-cumulative serial summative weekly quizzes
- Modular **mastery-based** system- differential progression- each student's test covered only the subjects they were taking

Ideas from our participants

# Designing Assessments

# Formative vs. Summative Assessments

| Formative | Summative |
| --- | --- |
| ● **Low-stakes** evaluations<br>● Leverage to **augment long term retention** of knowledge<br>● Improves **metacognition** | ● Traditionally higher-stakes assessments<br>● Increasingly used as **serial** lower-stakes **assessments**<br>● Requires the selection of assessment instruments which are **valid & reliable**(1). |

1. Sood R, Singh T. Assessment in medical education: Evolving perspectives and contemporary trends. Natl Med J INDIA. 2012;25(6):8.

# The Value of Well-Designed Assessments

**Well-designed assessments**

- Support the learning process
- Aid decision making (e.g., determining completion and need for remediation)

**Poorly-designed assessments**

- Do not gauge student learning
- Create frustration for students and faculty alike

# Planning Assessments

# Planning Assessments

Involves determining the need for instruction and analyzing both the **learners** and the **context** for learning

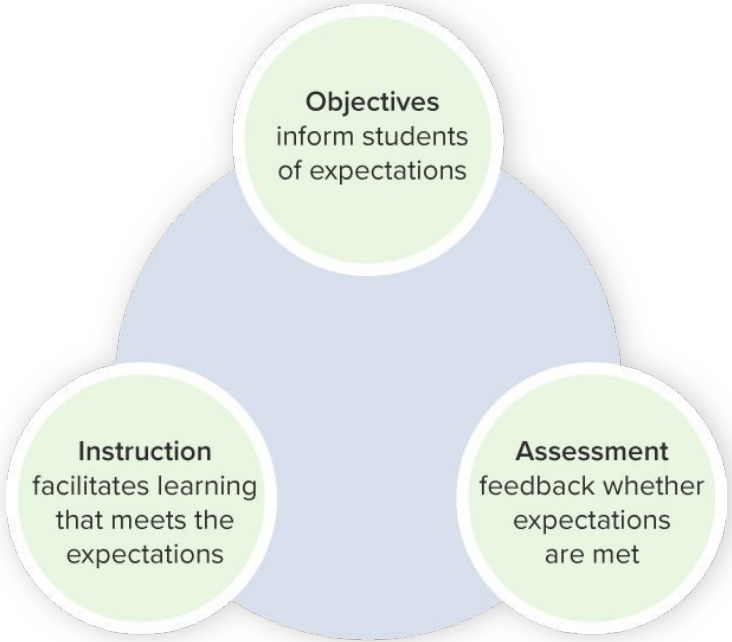
*Modified from AVIDesign(1)*

1. Hirumi A. IAMSE 2021—Plenary Session: Top 10 Ways an Instructional Designer Can Help You Define the New Normal. Med Sci Educ [Internet]. 2021 Sep 17 [cited 2022 Apr 15];31(Suppl 1):9–16. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8448173/

# Aligning Assessments

# Recap: “The Golden Triangle”

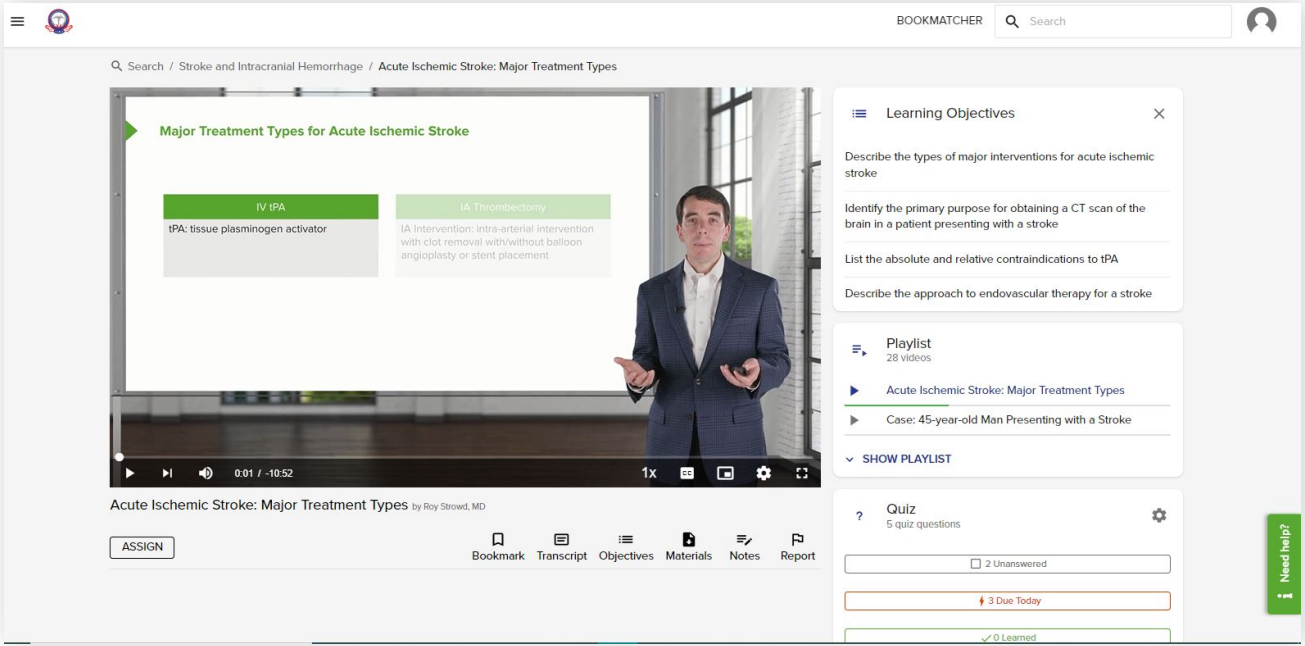
- Learning Objectives
- Instructional Strategies
- Assessments

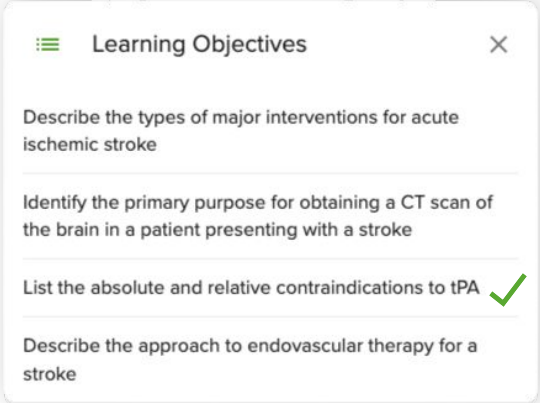



1. Chatterjee D, Corral J. How to Write Well-Defined Learning Objectives. J Educ Perioper Med JEPM [Internet]. 2017 Oct 1 [cited 2022 Jul 27];19(4):E610. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5944406/
2. Hirumi A. IAMSE 2021—Plenary Session: Top 10 Ways an Instructional Designer Can Help You Define the New Normal. Med Sci Educ [Internet]. 2021 Sep 17 [cited 2022 Apr 15];31(Suppl 1):9–16. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8448173/

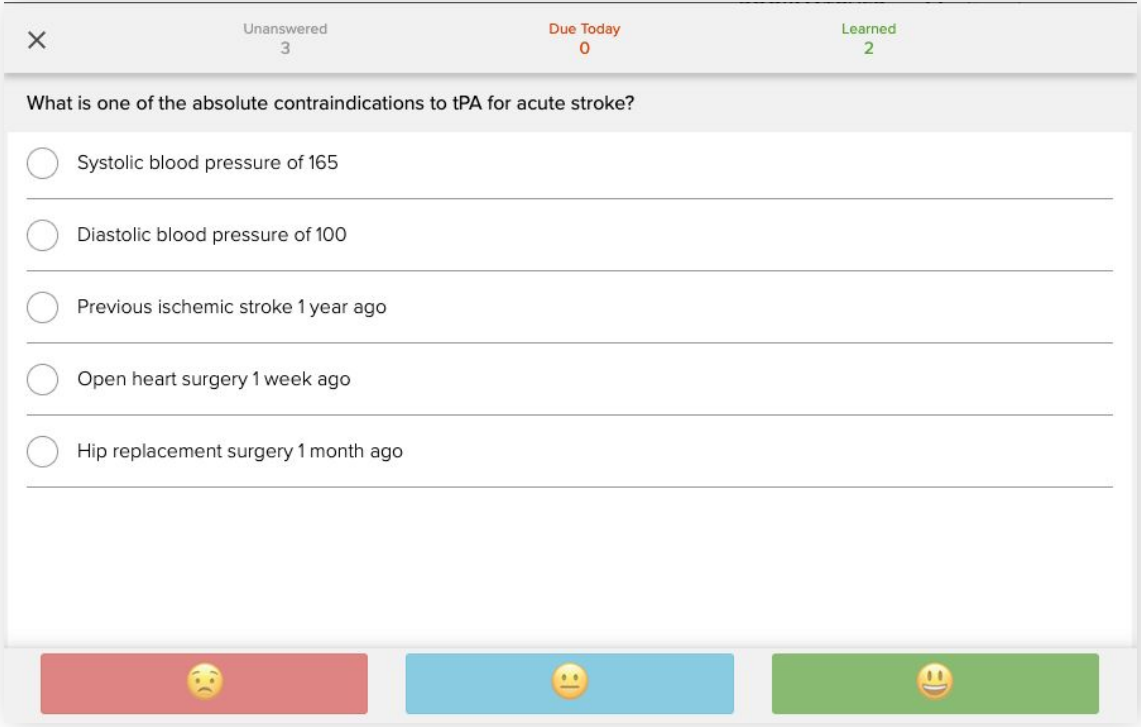
# Benefits of Technology

# Videos and Well-Written Learning Objectives



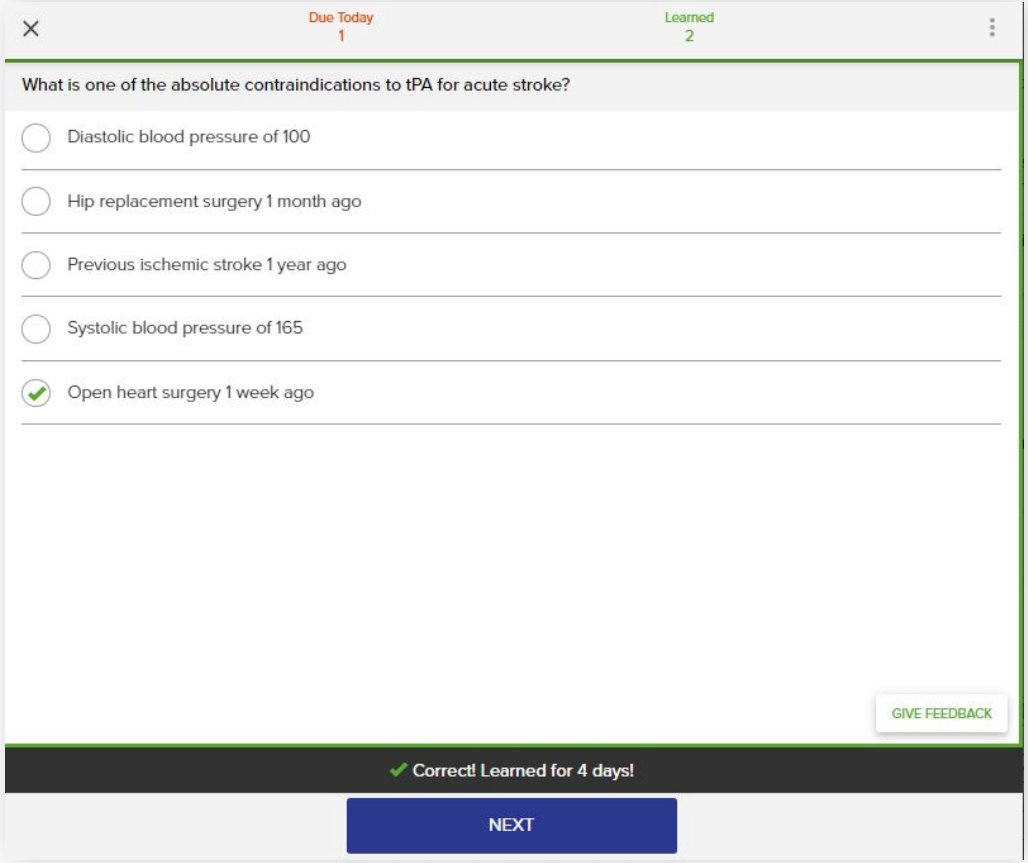



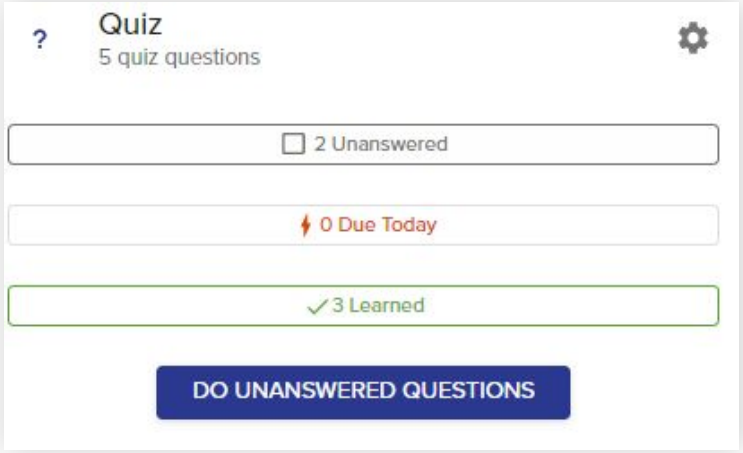
# Assessments & Retrieval Practice




**SpacedRep Quizzes** help students retain information and understand what they really know.
Helps faculty gain insights into what students need more help with.

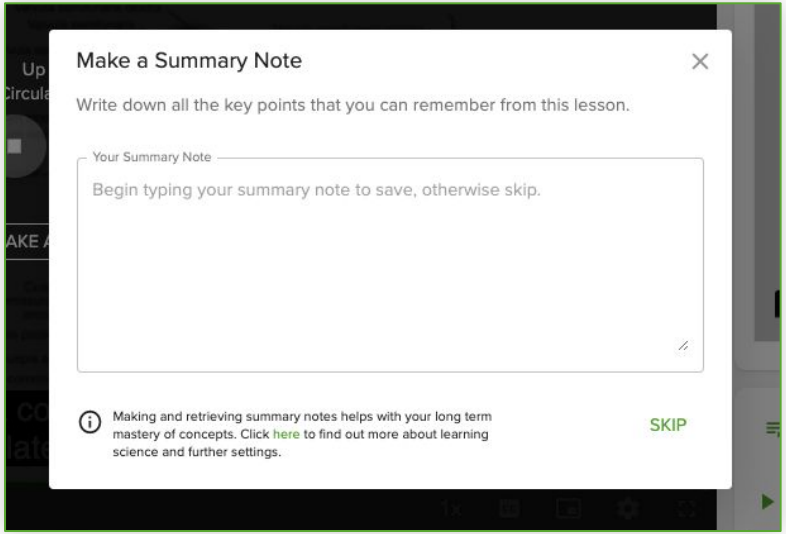
# Assessments & Retrieval Practice



# A Valuable Tool for Self-Assessment and Review

**Summary Note Pop Up:** asks you to summarize the key points after watching a video lesson

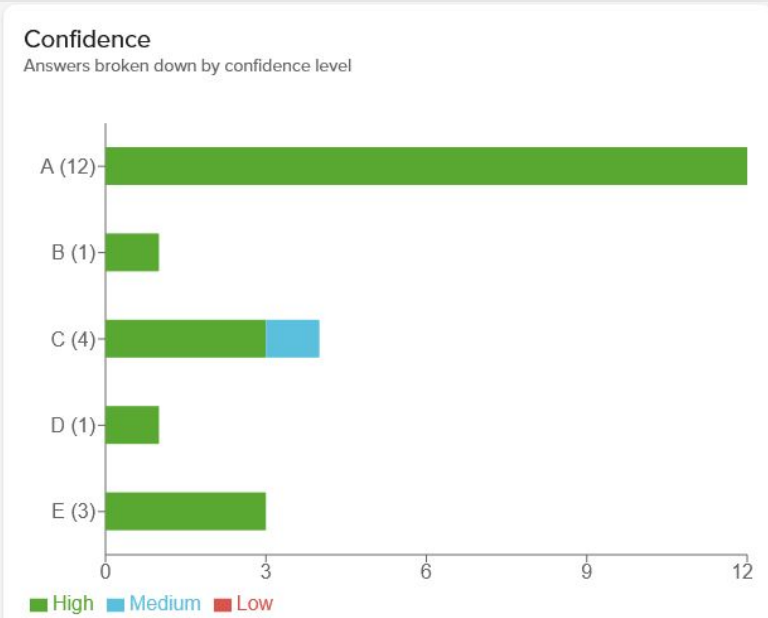


# Real-Time Feedback for Faculty & Students

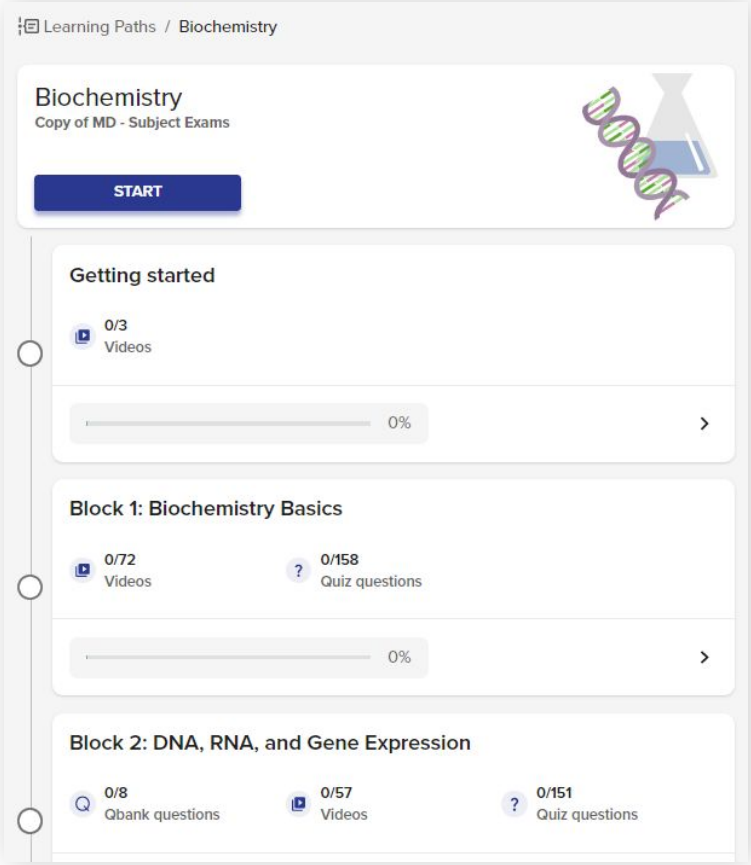
ID: 94416

Which of the following statements regarding the cervical segment of the spinal cord is TRUE?

| | | |
|---|---|---|
| A | It is divided into more cervical levels than the actual number of cervical vertebrae. | 57% |
| B | It contains 8 cervical vertebrae. | 5% |
| C | The number of cervical spinal nerves is less than the number of cervical vertebrae. | 19% |
| D | The number of cervical vertebrae and cervical spinal nerves is the same. | 5% |
| E | It gives rise to 7 pairs of cervical spinal nerves. | 14% |

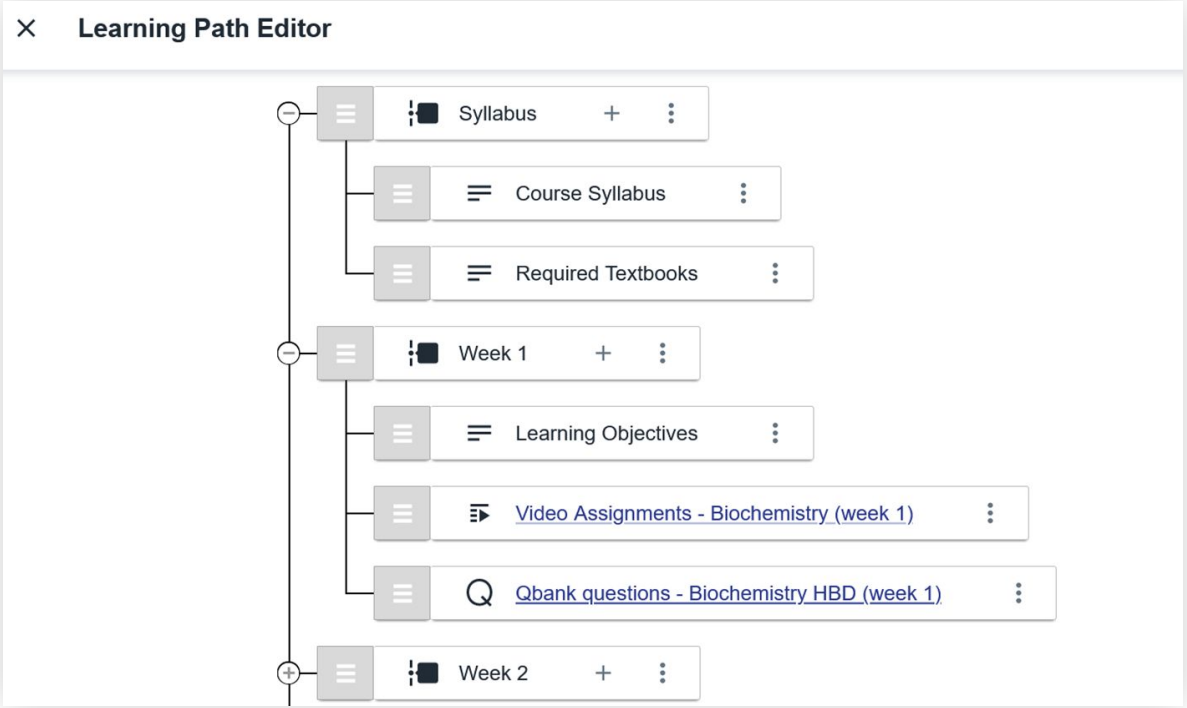


# The Learning Path




Learning Path Configuration help learning be more targeted and therefore more relevant to the target demographic

# The Learning Path Editor




The learning path is **editable** and can help educators plan and structure their courses including learning objectives, resources, assessments, and more.

# Technology Augments Assessments in Many Other Ways:

- Configurable Qbanks
- Administration & monitoring of exam (e.g. randomization of questions; browser security)
- Data tracking of question performance

QUESTION

# What technologies do you employ in delivering and tracking assessments?

*Tell us in the chat!*

# Assessment Types

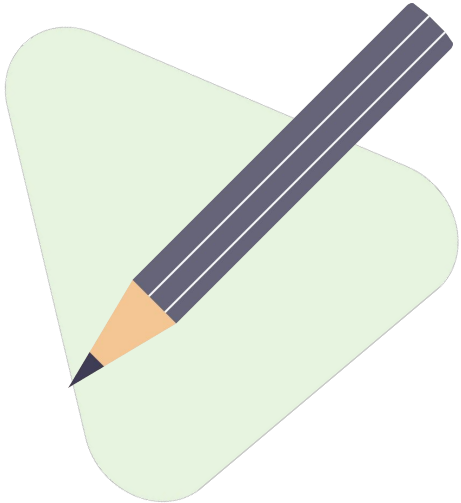
**Multiple Choice Questions (MCQ)**

**Extended Matching Questions (EMQ)**

**Open-Ended Questions**

# Writing Reliable MCQ

- The stem should fully formulate the problem or question.
- The responses should all grammatically match the stem.
- The options “all of the above” and “none of the above” should be used sparingly.
- Negative phrasing should be avoided.
- Avoid extreme statements such as always or never.




1. Kubiszyn T, Borich GD. Educational Testing and Measurement. John Wiley & Sons; 2016. 450 p.
2. Case SM, Swanson, David B. Constructing written test questions for the basic and clinical sciences. Philadelphia: National Board of Medical Examiners; 1998.
3. Larsen DP, Butler AC, Roediger III HL. Test-enhanced learning in medical education. Med Educ [Internet]. 2008 [cited 2022 Sep 12];42(10):959–66. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2923.2008.03124.x

Poll

2

What should be avoided when writing multiple choice questions (MCQ)?

a. Negative phrasing
b. Alignment with objectives
c. Case studies

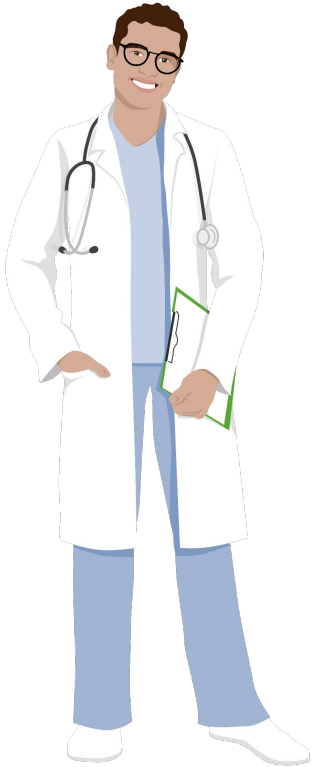
Result

2

What should be avoided when writing multiple choice questions (MCQ)?

a. Negative phrasing
b. Alignment with objectives
c. Case studies

# Entrustable Professional Activities (EPA) & Competencies



- **Assessment** must be considered through every step of this process.
- Assessment of these activities must embrace qualitative feedback based on **direct observation**.
- Includes 13 activities that all medical students should be able to perform upon entering residency.
- Used to develop c**ompetency-based objectives** and guide effective clinical assessments.

1. Core EPA Publications and Presentations [Internet]. AAMC. [cited 2022 Oct 6]. Available from: https://www.aamc.org/what-we-do/mission-areas/medical-education/cbme/core-epas/publications

# Recommendations

# Practical Implementation for **Instructors**

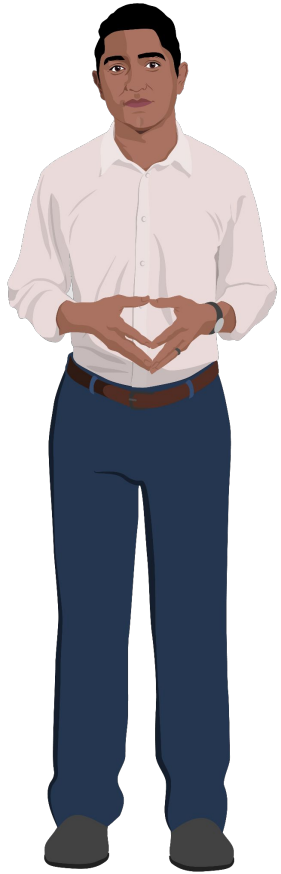
Harness the power of **technology**.

State your **expectations** clearly and comprehensively

Insure proper alignment of expectations (LOs) and assessments

Design and space tests for maximum effectiveness

Test often and in multiple ways



# Practical Implementation for **Students**

Use the **objectives** to help you plan and prioritize your studying.

Remember that you **learn by retrieving**- assessments should be your friend not your foe

Spacing out your learning is key to long-term retention. At all costs **avoid cramming**!

# Q&A Session

Leave your questions in the chat!

- **Assessments** can **augment** and reinforce **learning**, not just measure it.
- **Technology** can be used to facilitate assessments, track students' progress and performance and help provide feedback.
- Assessments include **more than just written exams.**

# Post-Event Handout

WORKSHEET FOR HEALTHCARE EDUCATORS

Learning Science

**Assessments: New uses for an old tool**

lecturio
www.lecturio.com



This template has been designed to help healthcare educators and educational specialists develop well-structured assessments that can effectively measure learning. Assessments are of different types and each type serves a specific purpose or a set of purposes. For this reason, it is important that educators ensure the development of valid and reliable assessments that align with the learning objectives.

# Important Post-Event Information

- **Follow-Up:** We will share the Assessments handout along with our follow-up survey, which we encourage you to complete.
- **Certificates:** An attendance certificate for the seminar can be requested on the survey form.
- **Summary Document:** A summary document of key strategies, including implementation tips and key points will be sent to all participants next week.

# Are You Interested in Our Future Events?

**Save the date** for our upcoming

Durable Learning Seminar

**The Year in Review: Lessons Learned and Plans for 2023**

December 14, 2022, 9:00 PST | 12:00 EST | 18:00 CET

**Are you interested in contributing to learning science?**

**Join our Learning Science team's research endeavors!**

Contact us: learning-science@lecturio.com

# Durable Learning

with Peter Horneffer, M.D.

lecturio MEDICAL

# Lecturio's Implementation of Assessments

Join our **regional demonstration sessions** to learn how you can use Lecturio to to **effectively assess** your students.

To participate, please choose a breakout room for one of the following **regional sessions**:

- ➔ USA, Canada, and Caribbean
- ➔ Europe and Middle East
- ➔ Latin America
- ➔ Africa
- ➔ Asia, NZ, Australia (Main Room)

*If you are having trouble joining your preferred room, please let us know in the chat and we will transfer you to the correct session.*

Contact us

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learning-science@lecturio.com