

Workshop

Taking Charge of Your Own Learning

AMEE 2022
Lyon, France

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Disclosures

Satria Nur Sya'ban, M.D.

I have the following professional relationship to disclose:

- Consulting role for Lecturio GmbH

Disclosures

Adonis Wazir, M.D.

I have the following professional relationship to disclose:

- Consulting role for Lecturio GmbH



TODAY'S AGENDA

1

Introductions

2

BEME and MedEd Research

3

Proposed Framework

4

Breakout Room

5

Wrap-Up and Next Steps

Taking Charge of Your Own Learning

Introductions

Pair Up and Get Three Facts from your partner

Ideas Include:

1. Their favorite **food**
2. Their favorite **animal**
3. Their favorite **way to study**

TASK



**Write down the main
expectation you have
for this session**

After this session, I hope to be able to...

TASK



Taking Charge of Your Own Learning

Objective Statements

Main Goal

“After this session, you should be able to.....”

Independently **recognize** shortcomings in how you are studying, and have the basics to **craft a plan** to change them

Session Objectives

RECOGNIZE

The *importance* of implementing evidence-based learning techniques for their future profession

DEFINE

What *some* evidence-based learning techniques are

Session Objectives

DESCRIBE

Evidence against some common study misconceptions

RECOGNIZE

Steps required to implement evidence-based learning techniques in their studies

Session Objectives

CONTRAST

Evidence-based techniques form less effective ones

CRITIQUE

Their learning techniques to begin constructing an approach that works best for them

Taking Charge of Your Own Learning

BEME and MedEd Research



Direct Poll

- Please **scan the QR code** with your phone, or **open** <http://etc.ch/cc7t>
- Respond to the polls on there

Medical Education Research

1

An increased importance on scientific research in the 1950s

2

Improved funding availability from various grants

3

Policy changes in accreditation allowing for a more flexible design

4

The need to keep up with the exponential growth of knowledge

5

A focus on accountability from regulatory bodies and the general public

6

Other factors (e.g. need to license foreign physicians and system changes)

Best-evidence Medical Education

“The implementation by teachers and educational bodies in their practice, of methods and approaches to education based on the best evidence available”¹



-
1. Haig A, Dozier M. BEME guide no. 3: systematic searching for evidence in medical education--part 2: constructing searches. Med Teach 2003;25(5):463-84
 2. RM. Harden, Janet Grant, Graham Buck R. BEME Guide No. 1: Best Evidence Medical Education. Med Teach. 1999 Jan;21(6):553–62.
 3. Masoomi R. What is the Best Evidence Medical Education? Res Dev Med Educ ISSN 2322-2719 [Internet]. 2012 [cited 2021 Apr 6]; Available from: http://journals.tbzmed.ac.ir/RDME/Abstract/RDME_20121022074916

Evidence-Based Learning



We are taught **evidence based medicine (EBM)**, with an increasingly **evidence-based approach (BEME)**.

?

Are we also doing the same thing with our personal approach to learning?

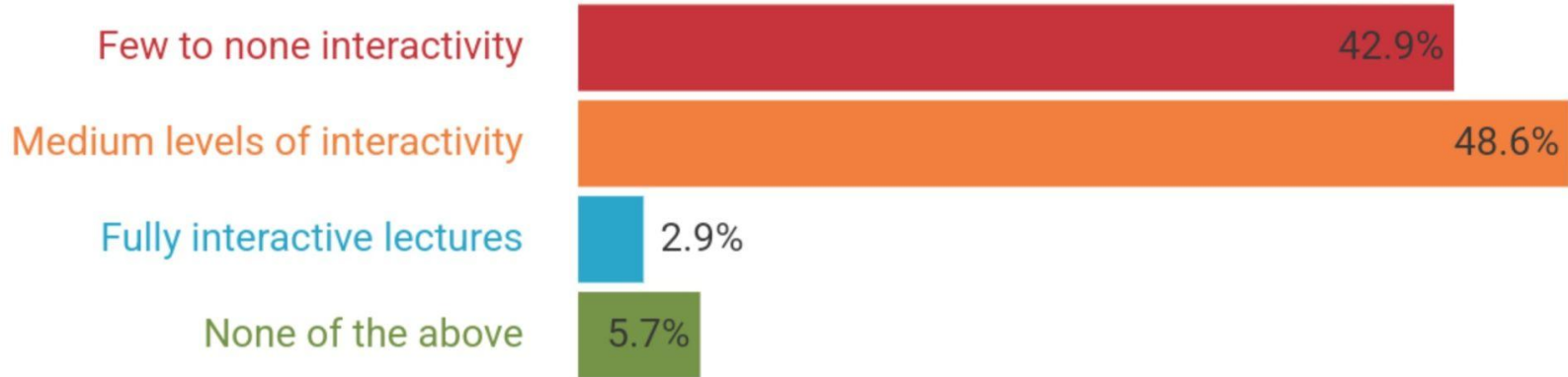
Students are taught **EBM**,
with **BEME** approach, but
individually **not learning in**
an evidence based manner

Problem



Results

How are the large hall lectures in your institution delivered?



Results

How do your teachers provide feedback after exams?



Reflections



Large variation between medical school means that it is more important than ever for students to also be independent and have an innate ability to study in an evidence based manner

Taking Charge of Your Own Learning

Evidence Based Learning Techniques

Definition



“...class of approaches, processes, and strategies that have been empirically demonstrated to produce learning outcomes”¹

1. Cranney, J., McDonald, F. (2012). Evidence-Based Learning. In: Seel, N.M. (eds) Encyclopedia of the Sciences of Learning. Springer, Boston, MA.
https://doi.org/10.1007/978-1-4419-1428-6_767

Conventions vs Evidence

Lectures

Conventions

Traditional didactic lectures are an appropriate and cost-effective way to teach medicine



Evidence-Based

Sessions focused on having students retrieve and elaborate, not simply receive information, are far more effective

Evidence

- Active teaching components deliver better learning outcomes
- Benefits include: ease in paying attention, increased participation, higher overall scores on tests
- Teachers increasingly prefer a “delegator teaching style”

Conventions vs Evidence

Cramming

Conventions

Studying all material close to an exam (cramming) can help students recall it better during the exam

Evidence-Based

Massed practice, as used in cramming, can produce positive results in the short term and feels effective, but leads to poor long term retention

Evidence

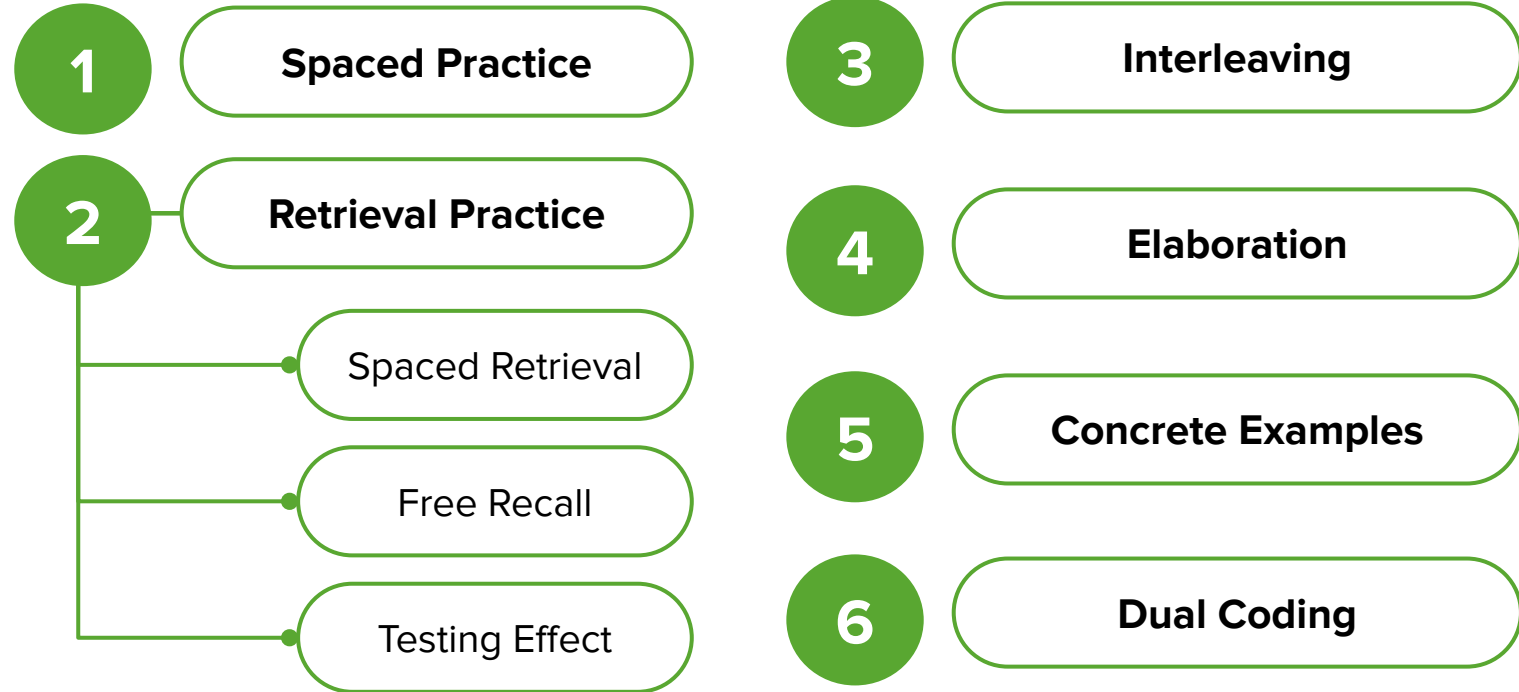
- Cramming has been shown to produce equivalent results in the short term, but underperforms spaced practice in longer retention intervals¹
- Spaced learning produced better test results when compared to massed practice^{2,3}

1. Dunlosky J, Rawson KA, Marsh EJ, Nathan MJ, Willingham DT. Improving Students' Learning With Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology. Psychol Sci Public Interest. 2013 Jan;14(1):4–58.

2. Breckwoldt J, Ludwig JR, Plener J, Schröder T, Gruber H, Peters H. Differences in procedural knowledge after a “spaced” and a “massed” version of an intensive course in emergency medicine, investigating a very short spacing interval. BMC Med Educ. 2016 Dec;16(1):249.

3. Kumar Kommu P, Sahoo S, Kapoor A, Sharma A, Thomas V. Impact of a spaced learning initiative in an undergraduate student teaching program in pediatrics. J Curr Res Sci Med. 2018;4(1):37.

Learning Science Strategies



Learning Science Strategies

1

Spaced Practice

2

Retrieval Practice

3

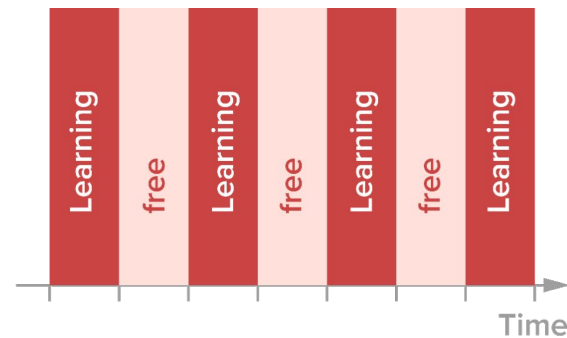
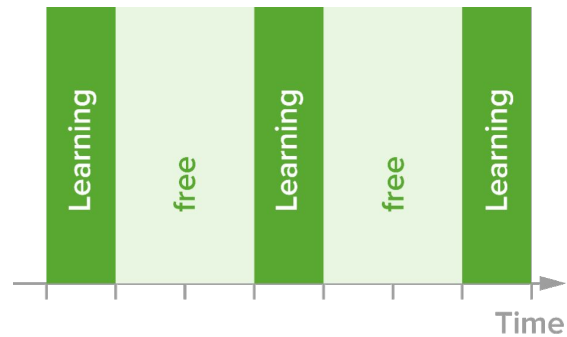
Interleaving

4

Elaboration

Spaced Practice

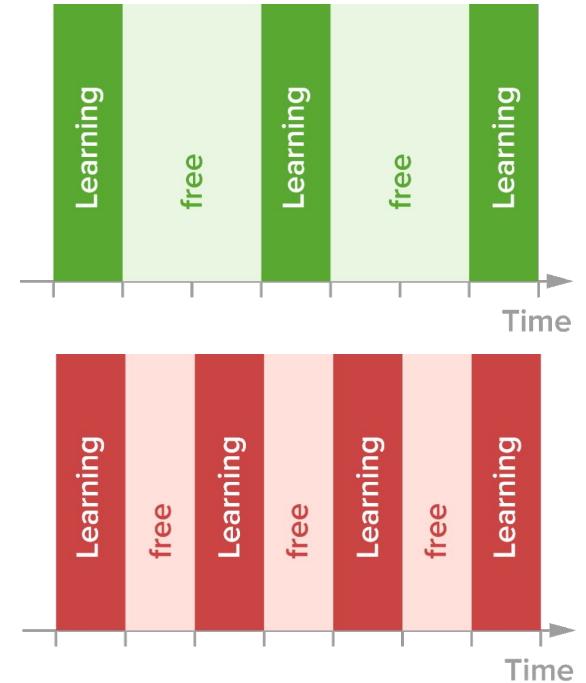
1



What do you think the image is describing?

Spaced Learning

Distributing the study of a concept across multiple sessions separated by a period of time



1. Versteeg M, Hendriks RA, Thomas A, Ommering BWC, Steendijk P. Conceptualising spaced learning in health professions education: A scoping review. Med Educ. 2020

Important Terms To Note



ISI

Interstudy Interval

The time interval between two study sessions



RI

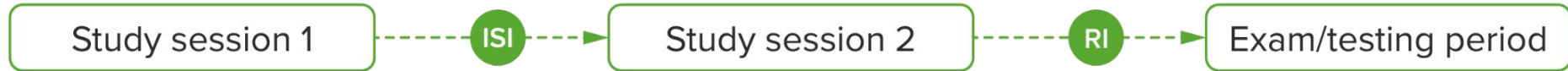
Retention Interval

The time between the last study session and the test event

-
1. Carolina E. MW, Küpper-Tetzel undefined, Weston T, Kim ASN, Kapler IV, Foot-Seymour V. Enhancing the Quality of Student Learning Using Distributed Practice. In: Dunlosky J, Rawson KA, editors. The Cambridge Handbook of Cognition and Education [Internet]. Cambridge: Cambridge University Press; 2019 [cited 2021 Mar 3]. p. 550–84. (Cambridge Handbooks in Psychology).

What it looks like in practice

ISI Interstudy interval RI Retention interval



-
1. Carolina E. MW, Küpper-Tetzel undefined, Weston T, Kim ASN, Kapler IV, Foot-Seymour V. Enhancing the Quality of Student Learning Using Distributed Practice. In: Dunlosky J, Rawson KA, editors. The Cambridge Handbook of Cognition and Education [Internet]. Cambridge: Cambridge University Press; 2019 [cited 2021 Mar 3]. p. 550–84. (Cambridge Handbooks in Psychology).

Evidence

Students in a group that followed a “lighter” spaced scheduling performed better than students that followed a “massed” version of the same course

Massed Group

102 Students in the massed group that who performed the same *Key-Feature test* reached a **mean score of 13.7 points (out of 22)**

Spaced Group

54 students in the spaced group obtained a **higher mean score of 14.8 points (out of 22)**, a statistically **significant** difference from the other group (**p=.002** (Mann–Whitney-U); Cohen’s d: 0.558)

-
1. Breckwoldt J, Ludwig JR, Plener J, Schröder T, Gruber H, Peters H. Differences in procedural knowledge after a “spaced” and a “massed” version of an intensive course in emergency medicine, investigating a very short spacing interval. BMC Med Educ. 2016 Dec;16(1):249.

Retrieval Practice

2

Based on the name, what do you think retrieval practice might be?

Retrieval Practice

*“The act of **calling information to mind** rather than rereading it or hearing it.produce[ing] ‘**an effort from within**’ to induce **better retention**.” (1).*

It includes:



Testing Effect



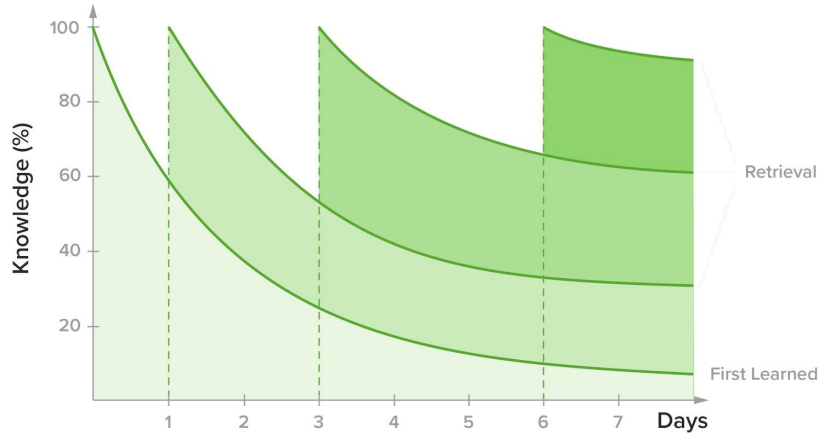
**Spaced
Retrieval**



Free Recall

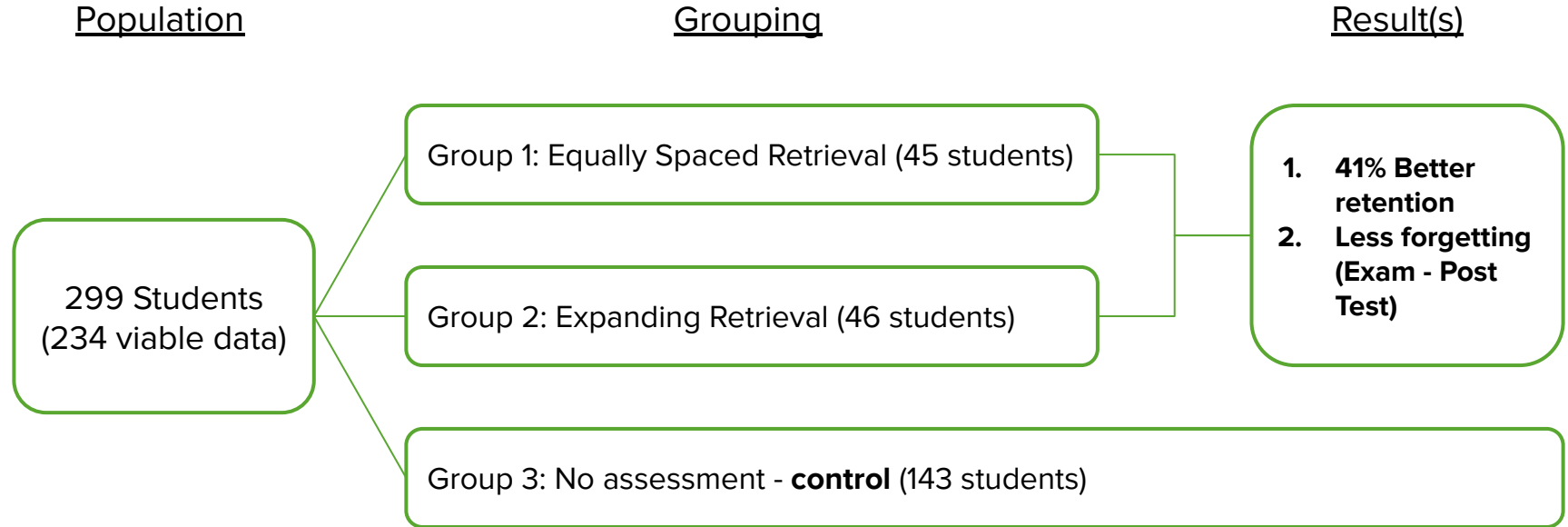
Spaced Retrieval

Periodically retrieving knowledge on a certain topic at certain intervals



- Used interchangeably with spaced repetition, distributed practice, etc.
- Combines **'Testing Effect' / 'Retrieval Practice,'** and **'Spaced Learning'**
- Essential for optimizing long-term retention

Spaced Retrieval



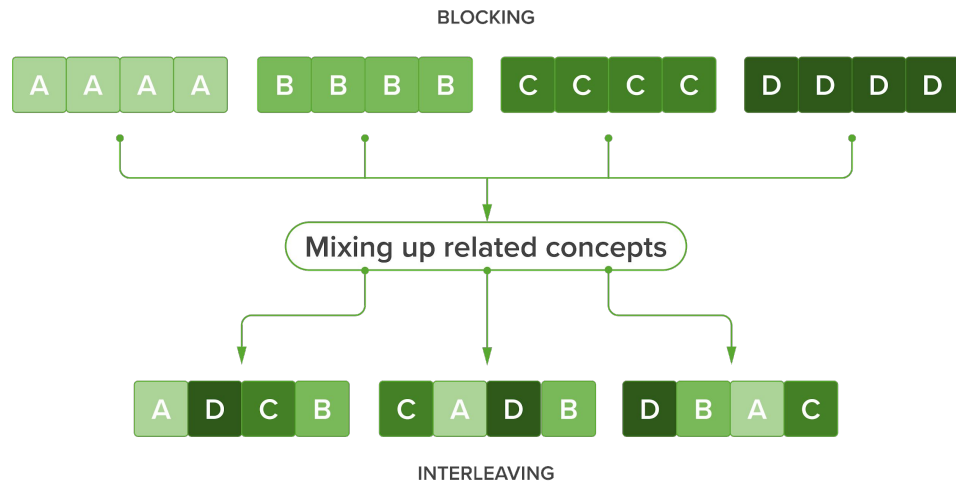
-
1. Dobson, J. L. (2013). *Retrieval practice is an efficient method of enhancing the retention of anatomy and physiology information. Advances in Physiology Education*, 37(2), 184–191. doi:10.1152/advan.00174.2012

Interleaving

3

Based on the name, what do you think this is?

Interleaving



The practice of mixing different related subjects or topics when learning

Interleaving

Blocked practice



Higher perceived mastery

Interleaved practice



Better diagnostic accuracy

Interleaving

Research by Hatala et al. (2003) showed the benefit of mixing **contrastive topics** rather than similar topics in the context of ECG interpretations in a group of medical students ($F(1,65) = 14.58, p < 0.05$)

Non-Contrastive

Students who were taught the diagnoses sequentially based on types had a **1.8 out of 6 (30%)** (sd = 1.05) **diagnostic accuracy** when provided with new examples of the practice diagnoses

Contrastive

Those who were shown examples in a mixed practice fashion (contrasting topics) had a **2.8 out of 6 (47%)** (sd = 0.94) **diagnostic accuracy** when given the same cases

-
1. Hatala, R. M., Brooks, L. R., & Norman, G. R. (2003). Practice makes perfect: The critical role of mixed practice in the acquisition of ECG interpretation skills. *Advances in Health Sciences Education*, 8(1), 17–26. <https://doi.org/10.1023/a:1022687404380>

Elaboration

4

Based on the name, what do you think this is?

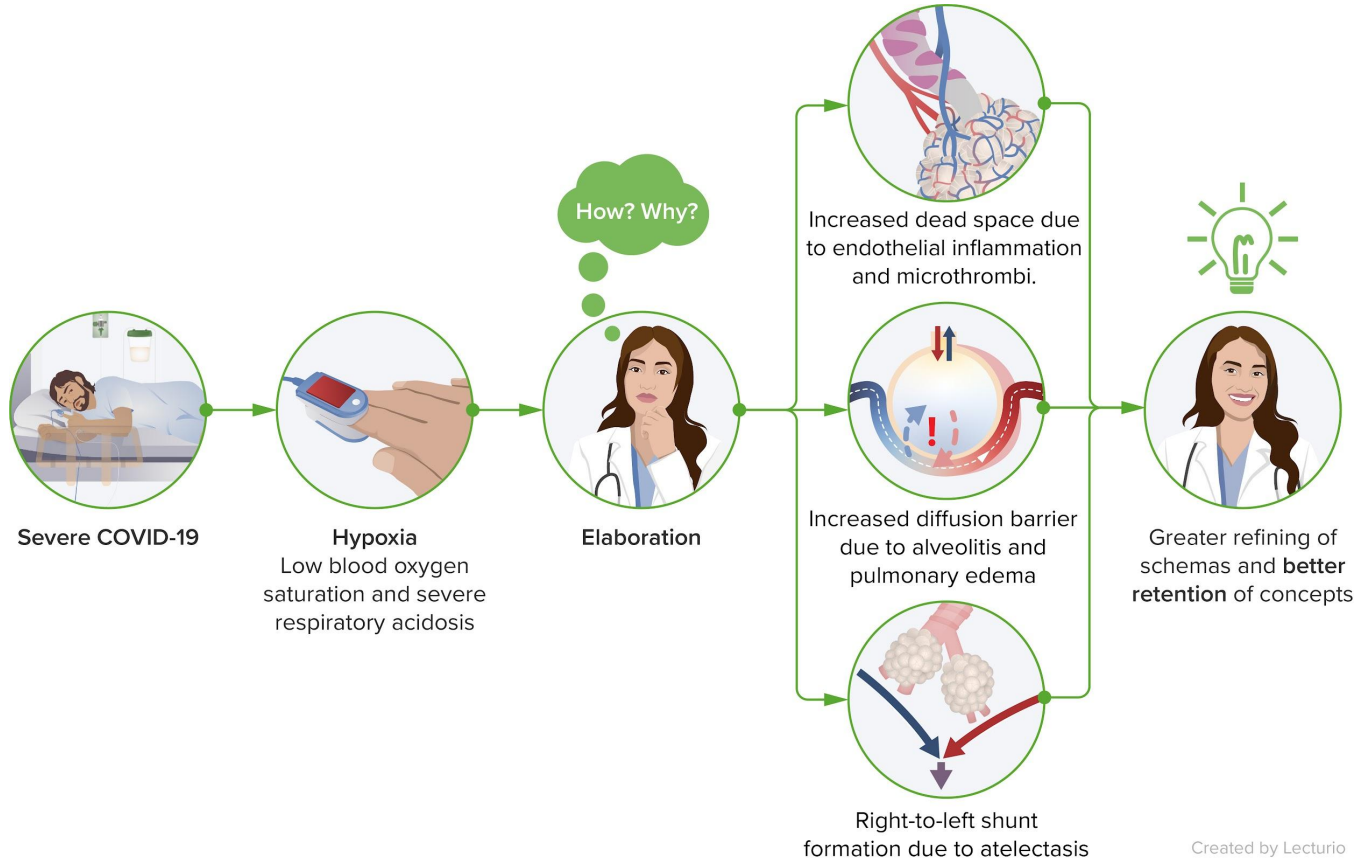
Definition



A strategy Involving the **learner's enhancement** of information, which can be implemented by means of an **inference, image, comparison, illustration, or overall summary.**

1. Bjork RA. Memory and metamemory considerations in the training of human beings. In: Metacognition: Knowing about knowing. Cambridge, MA, US: The MIT Press; 1994. p. 185–205.
2. Hamilton R. Elaboration Effects on Learning. In: Seel NM, editor. Encyclopedia of the Sciences of Learning [Internet]. Boston, MA: Springer US; 2012 [cited 2021 Dec 4]. p. 1103–5. Available from: http://link.springer.com/10.1007/978-1-4419-1428-6_170
3. American Physiological Association. APA Dictionary of Psychology [Internet]. 2020 [cited 2021 Nov 4]. Available from: <https://dictionary.apa.org/>

Application



Example of Elaboration

Why do you think Dr. Z's students lose focus and find his examinations too difficult?

- **Question Structure:** Elaborative, utilizes “*why*” and “*how*” prompts
- **Mechanism:**
 - It prompts students to delineate *reasons for the fact*, encouraging them to utilize existing knowledge to **interpret and build on** available information.
 - Once answered, this builds on the existing knowledge gleaned from the case itself.
 - Elaborating creates more elaborate schemas and adds new layers of meaning to new concepts.

Who is now ready to
completely change their
study style?

Show of Hands



Taking Charge of Your Own Learning

Proposed Framework



Scan Code for Worksheet

- Please **scan the QR code** with your phone

Steps of the Worksheet

1

Identify Learning Goals

2

Identify Current Situation

3

Reflect on your learning process

4

Reflect on the outcomes of your learning process

Step 5: Set SMART Goals



S

Specific

M

Measurable

A

Achievable

R

Relevant

T

Time-bound

SMART Goal – Medical Example

In the middle of your ObGyn rotation: Finish reading the ObGyn chapter on first trimester pathologies by 8 p.m. tonight

S

Specific: The task is clearly defined, what is to be read and the subject matter of the task is mentioned and easily understandable.

M

Measurable: You can measure the success of the task, i.e., once you finish reading the chapter, it means the task is complete

A

Achievable: One chapter is not overly ambitious. You can do it within the several hours of time between your last lecture and 8 p.m.

R

Relevant: the class topic tomorrow is about differentials for bleeding during pregnancy, so this task is relevant to your educational context at the moment

T

Time-bound: 8 PM provides the task a time-frame for completion. This makes it more directed and is conducive to its completion

Taking Charge of Your Own Learning

Small Working Groups

Instructions

- If your table is full, then you may stay on your table
- However if you are less than 4 people, please join another table to make sure that we have at least 4-6 people per discussion group
- You have 30 minutes to discuss the following three questions, each will have a time slot of 10 minutes.
- Please designate **one person** as a minute taker of the discussion and **one person** as the moderator of the discussion.
- There are clear **guide questions** that we advise you to follow, please try to follow them first before branching off into side discussions
- (Optional) You may use the worksheet as a reference point if you feel necessary but the discussion should reflect on a real experience that you have had as a learner / that you have seen in your trainees / students.

Question

1

What are the three poorest study techniques you have used before? Why do you think they do not work?

It is also alright to consider more superficial techniques such as how you highlight your texts and pulling all-nighters before an exam.

Question

2

How would you fix those poor study techniques?

If it is in a spectrum, also consider what would be on the opposite side of the spectrum from those poor techniques? E.g., Cramming vs Spaced learning, massive highlighting vs targetted highlighting

Question

3

Set several SMART goals for yourself for the upcoming 6 months to be able to make those changes?

Articulate, with the SMART goal framework, your change targets to improve the effectiveness of your learning process and incorporate evidence-based learning techniques into it. If you do not know yet what evidence-based learning techniques you will use, include a goal as well to describe how you will figure that out

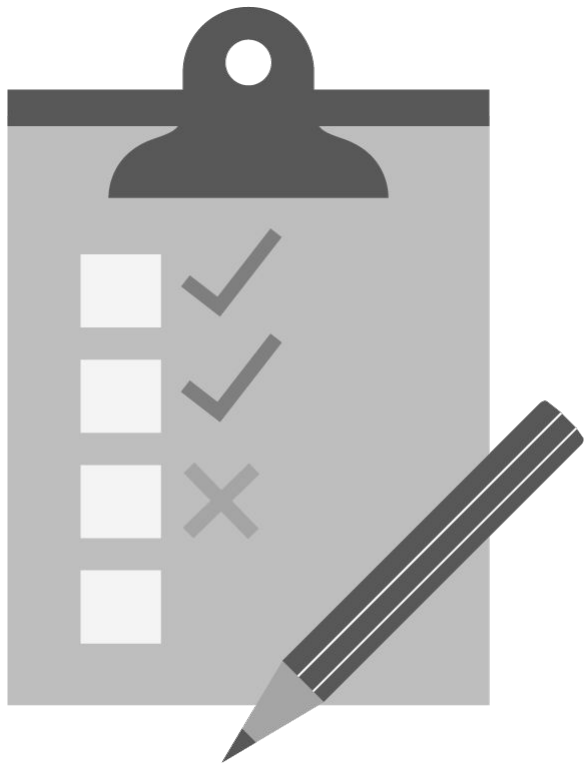
Taking Charge of Your Own Learning

Presentations

Taking Charge of Your Own Learning

Wrap Up

Key Takeaways



- Taking charge of your learning starts by first understanding how you are learning
- There is no magical technique to make you a good student in one day.
- Deliberate, directed, and durable effort is required to create a lasting change.
- Student-teacher collaboration on this front will move the effort miles in the right direction.